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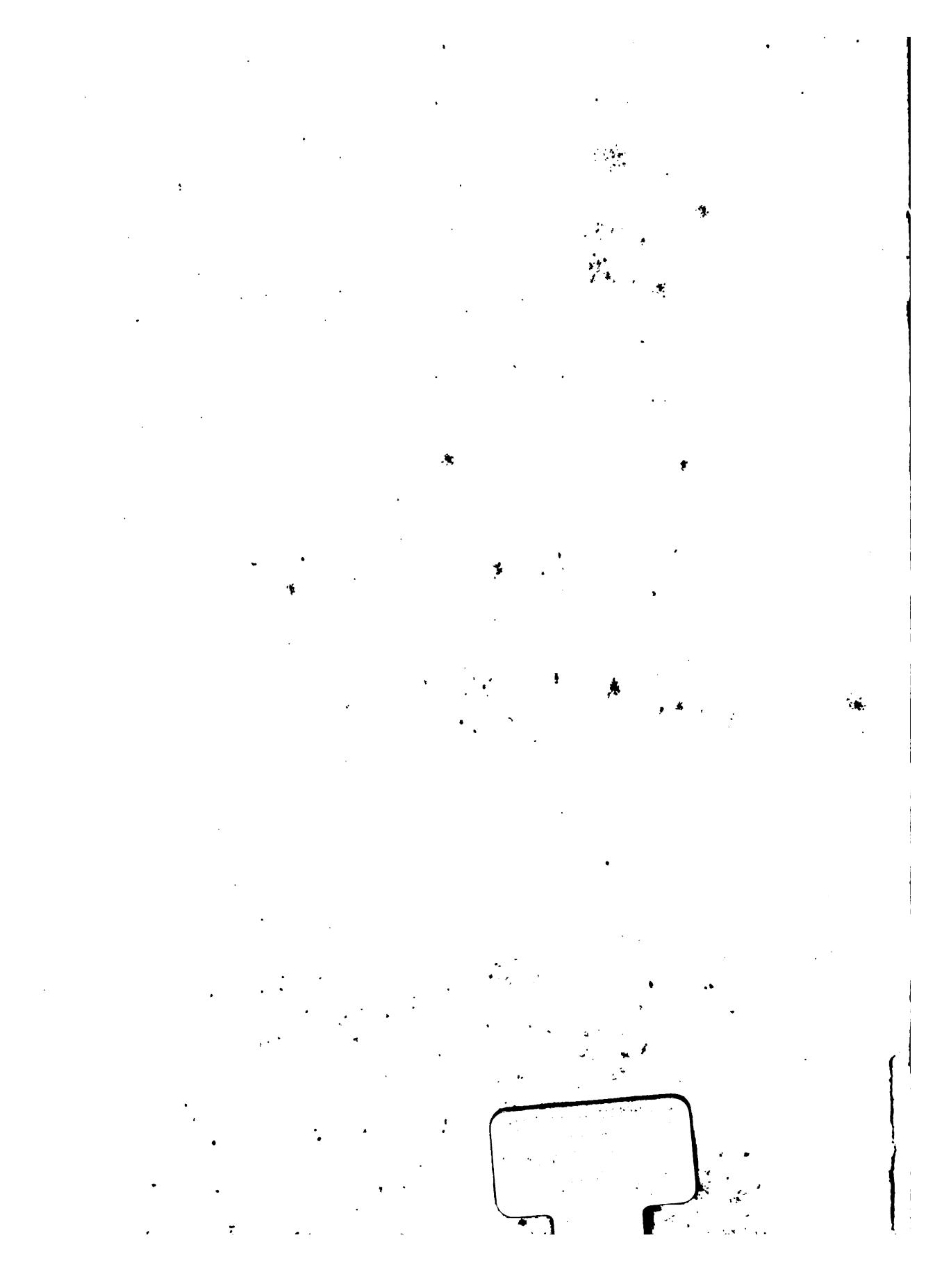
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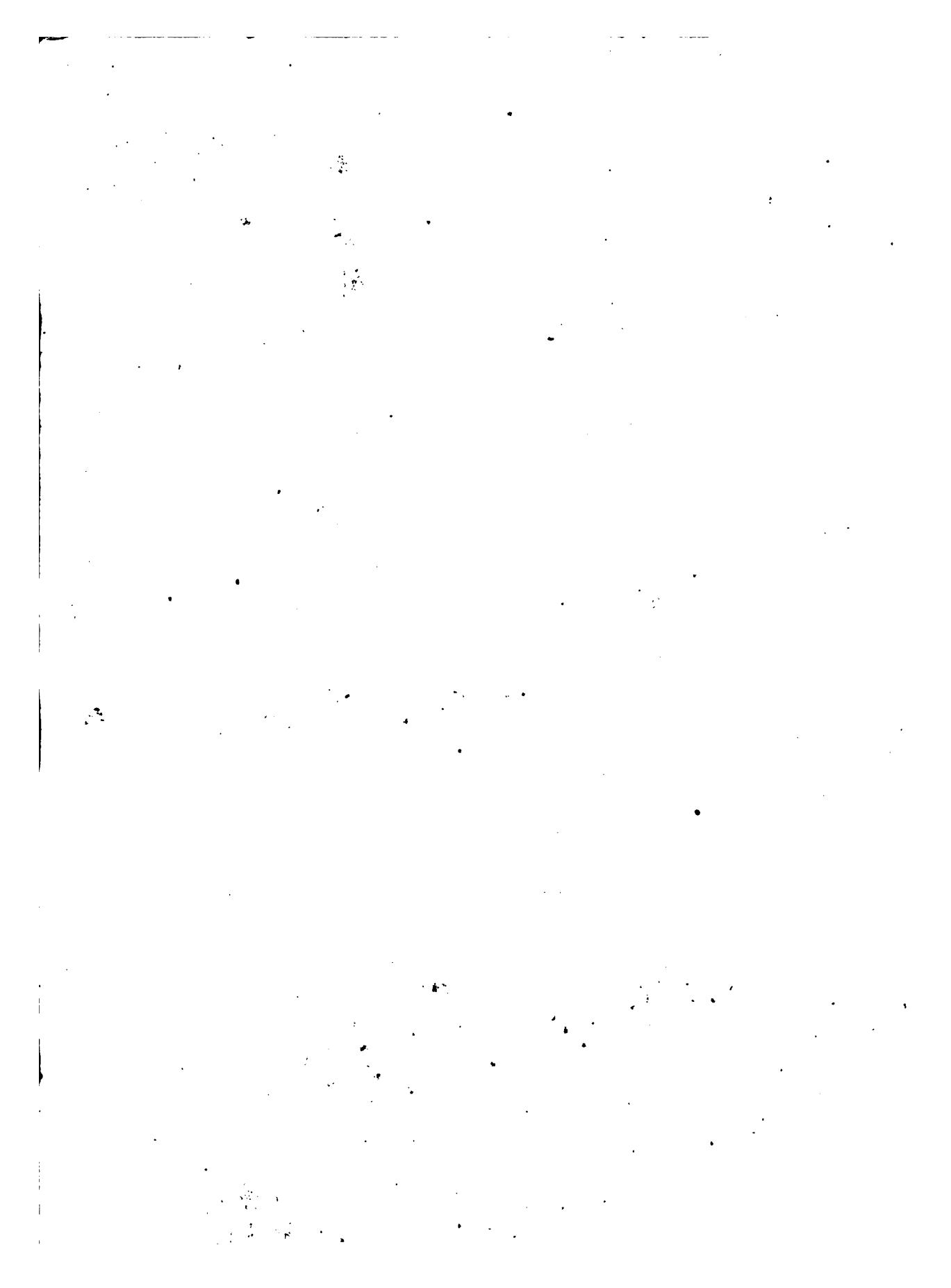
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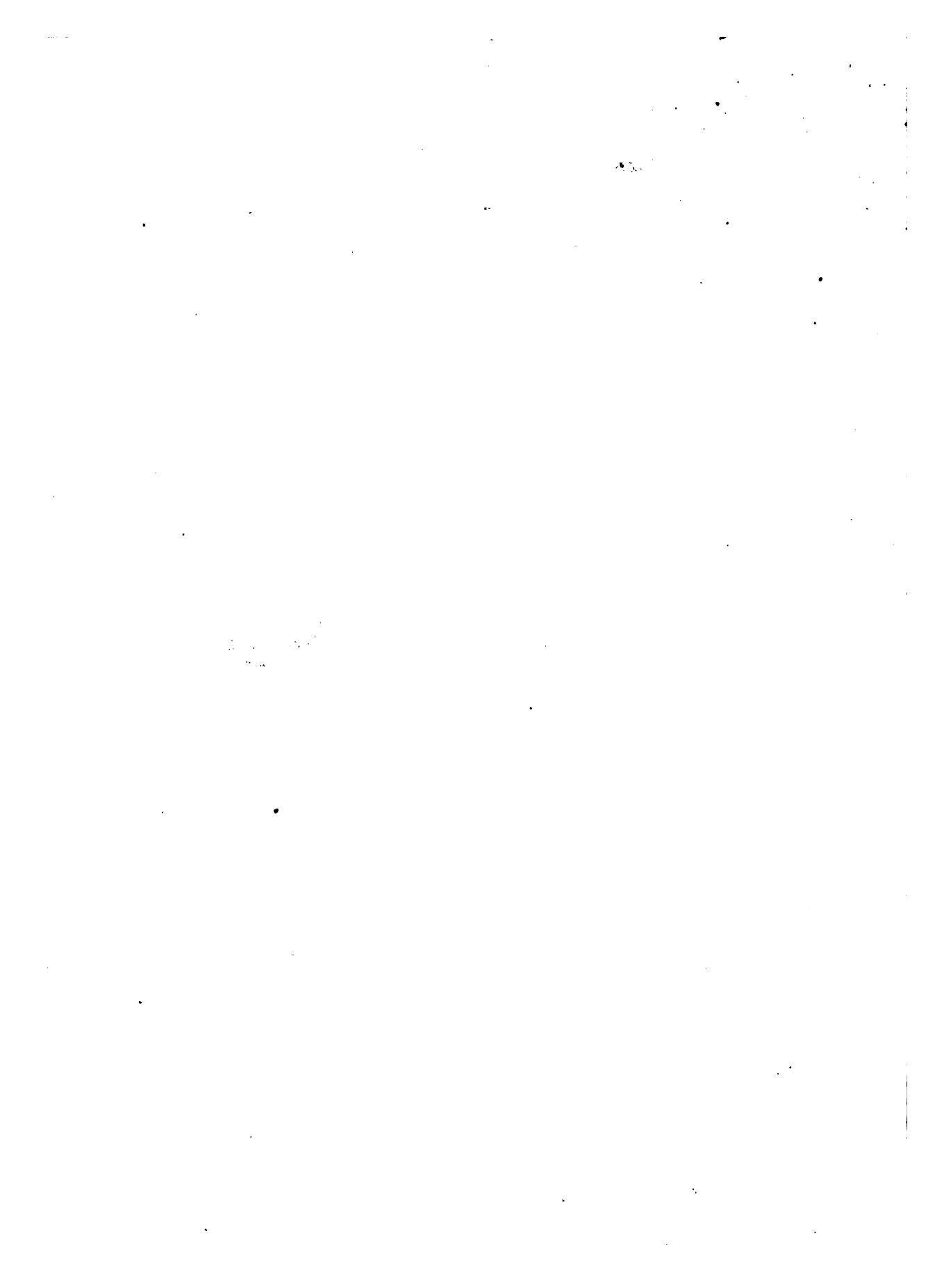
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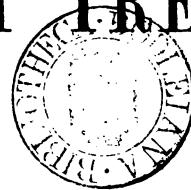
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THE
MINIATURE FRUIT GARDEN;
OR,
THE CULTURE
OF
PYRAMIDAL FRUIT TREES;
WITH
INSTRUCTIONS FOR ROOT PRUNING, &c.



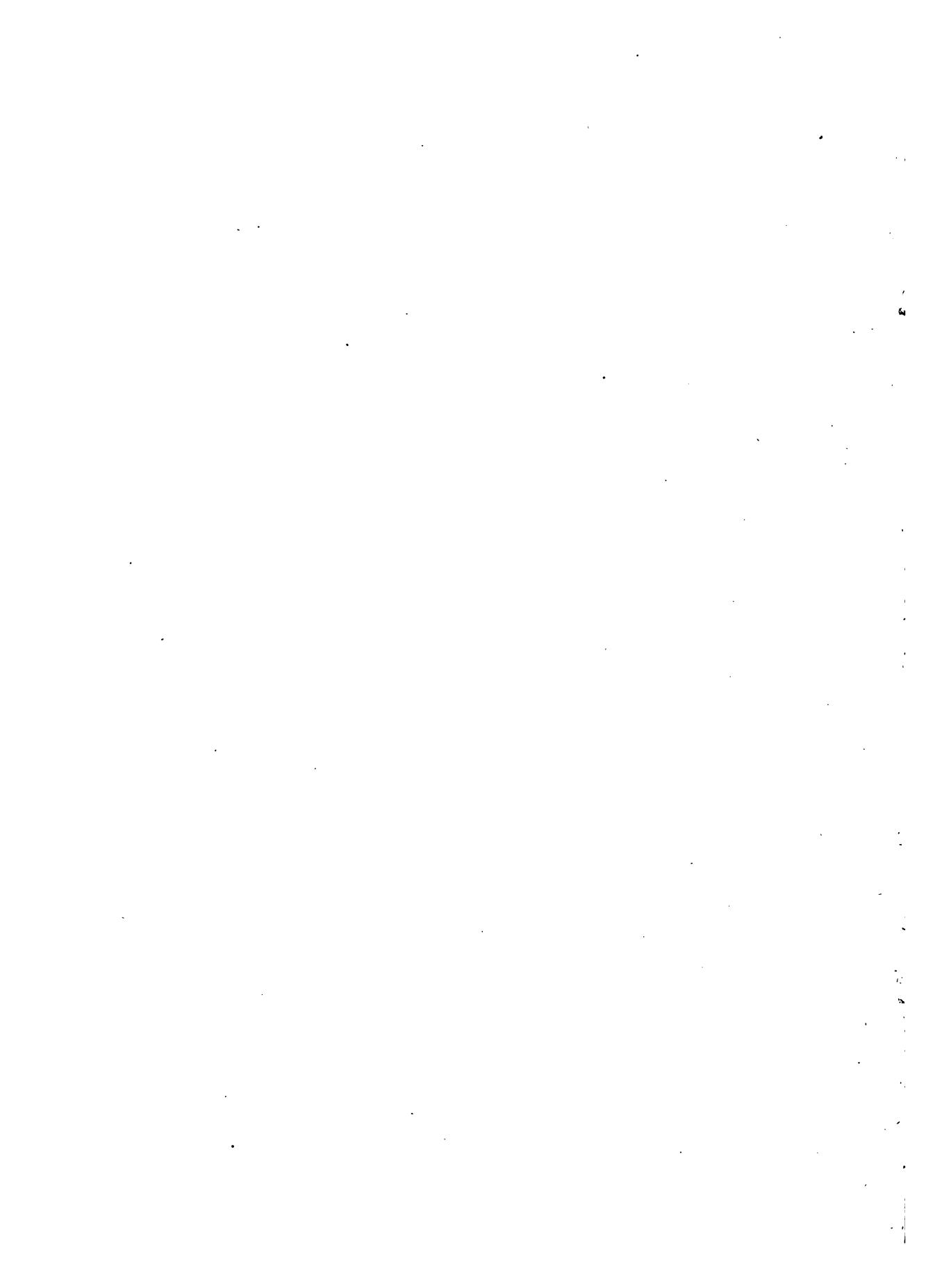
BY THOMAS RIVERS,
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INTRODUCTION.

IT is now some fifteen or more years since I wrote a short article on root-pruning of pear trees, which is published in the transactions of the Horticultural Society. I had then practised it several years; so that I may now claim a little more attention, if the old adage that “practice makes perfect” be worthy of notice.

There is perhaps no fruit tree that claims or deserves our attention equal to the pear. How delicious is a fine melting pear all the winter months! and to what a lengthened period in the spring may they be brought to table! In June, 1848, I ate some fruit of *Ne plus Meuris*, the produce of 1847, which were really melting and agreeable; on July 12th of the same year, I enjoyed the juicy freshness of *Doyenné d'Eté*, fresh from the tree; and on July 20th was delighted with some fine fruit of *Citron des Carmes*, from trees on quince stocks, only three feet high, and yet covered with fruit. As an interesting fact, I may also mention that on looking into my fruit room, I found half a dozen fine, handsome, plump, and sound specimens of the pear *Leon le Clerc de Laval*, of the crop of 1847; this is a baking or stewing pear all the winter, but to my surprise I found them soft, juicy, and agreeable,—not, of course, high flavoured, but really very good; I was thus enabled to make two dishes of the pears of two seasons. Till lately *Beurre Rance* has been our best spring pear; but this is a most uncertain variety, rarely keeping till the end of May, and often ripening in January and February. The new Belgian pears, raised by the late Major Esperen, of Malines, are likely for the present to be the most valuable for prolonging the season of rich melting pears, and of these *Josephine de Malines* and *Bergamotte d'Esperen* are especially deserving of notice; they have the excellent quality of ripening slowly; but improvement will, I have no doubt, yet take place, for pears are so easily raised from seed, and so soon brought into bearing by grafting or budding them on the quince stock, that new and valuable late pears will soon be as plentiful as new roses. Even chance will do a great deal, for only some six years since, I raised two seedlings from the Easter *Beurre*, and having three bearing trees of that sort growing within a few feet of each other, I was curious to see if the children would be at all like the parent; I accordingly cut down two of them, and grafted them with the two seedlings, leaving one tree untouched.

those seedlings were numbered 1 and 2; both bore fruit in 1847 in abundance, while on the parent not a blossom escaped the spring frost; this gave proof of increased hardiness; the fruit of No. 1 were nearly, if not quite, equal in size to the original sort; those of No. 2 were round, small, and thickly covered with russet. No. 1 ripened in April, and proved a melting and delicious pear; No. 2 kept till June, and was dry, hard, and worthless. In the spring of 1848 No. 1 blossomed from eight to ten days after the parent tree, and had a fair sprinkling of fruit on it; but not a blossom of its parent escaped the frost of the 27th of April. Here, then, we have a valuable late pear raised by chance, and one out of two; but I must confess that, some twenty years since, I raised a great number, perhaps from old inferior sorts, not one of which proved worthy of propagation.

In the following pages it will be seen that I strongly advocate the culture of pyramidal fruit trees; this is no new idea with me. I have paid many visits to the continental gardens during the greater portion of my active life of business, and have always admired their pyramidal trees when well managed, and I have for many years cultivated them for my amusement; but, owing to a seeming prejudice against them among some English gardeners, I was for some time deterred from recommending them, for I thought that men older than myself must know better; and when I heard some of our market gardeners and large fruit-growers in the neighbourhood of London scoff at pears grafted on the quince stock, as giving fruit of very inferior flavour, I concluded, like an Englishman, that the foreigners were very ignorant, and very far behind us in the culture of fruit trees. It was only by repeated visits to foreign gardens that this prejudice was dispelled; and when I saw the beautiful pear trees in the *Jardin des Plantes* at Paris, under the management of Monsieur Cappe, alluded to in *Gardener's Chronicle*, No. 28, 1847, I felt convinced that we are very far behind our neighbours in the management of fruit trees adapted to the open borders of our gardens. I have, therefore, endeavoured to make the culture of pyramidal trees easy to the uninitiated; and, having profited largely by experience in attending to it with my own hands, I trust that my readers will benefit by the result.

A humid mild climate seems extremely favourable to the well doing of the pear on the quince stock. Jersey, with its moist warm climate, as is well known, produces the finest pears in Europe: these are for the most part from trees on quince stocks. The western coast of Scotland, I have reason to know, is favourable for the culture of pear trees on the quince; and within these very few years Ireland has proved remarkably so, more particularly in the south, where some of our finest varieties of pears on quince stocks are cultivated with perfect success.

THE
CULTURE OF PYRAMIDAL PEAR TREES
ON THE QUINCE STOCK.

“This”—the pyramidal—“is, without contradiction, the most natural form of a great many trees; and the success that has followed their cultivation for many years proves the goodness of this system of training.”* I give the words of a most experienced French gardener, and can add my testimony as to the eligibility of this mode of cultivating the pear in England; and I cannot but express my surprise that it has fallen to my lot to bring it before the public, practised as it has been for so many years on the Continent.

For gardens with a moderately deep and fertile soil, pears budded on the quince stock will be found to make by far the most fruitful and quick-bearing trees; indeed, if prepared by one or two removals, their roots become a perfect mass of fibres, and their stems and branches full of blossom-buds. Trees of this description may be planted in the autumn, with a certainty of having a crop of fruit the first season after planting; always recollecting that a spring frost may destroy the blossom unless the trees are protected.

The most eligible season for planting pyramidal pear trees is during the months of November and December, but they may be planted even until the end of March; in planting so late, no fruit must be expected the first season. If root-pruned pyramidal trees are planted, it will much assist them if about half the blossom-buds are thinned out with sharp-pointed scissors or a penknife just before they open; otherwise these root-pruned trees on the quince stock are so full of them, that the tree receives a check if they are all allowed to expand. About ten or fifteen fruit may be permitted to ripen the first season; the following season two or three dozen will be as many as the tree ought to be allowed to bring to perfection; increasing the number as the tree increases in vigour, always remembering that a few full-sized and well-ripened pears are to be preferred to a greater number inferior in size and quality.

In the engraving at the end I have given a faithful portrait of a pyramidal tree of Beurré de Capiaumont, budded on the quince; this was taken in 1846; the tree was then about ten years old, and had been root-pruned three times. Nothing could be more interesting than this tree, only six feet high, laden with fruit of extraordinary beauty; for in my soil pears on quince stocks produce fruit of much greater beauty and of finer flavour than those on pear stocks. I have, however, introduced the figure of this tree as much to show its imperfection as its beauty: it will be observed that its lower tiers of branches are not sufficiently developed; this was owing to neglect when the tree was young—the upper branches were suffered to grow too luxuriantly. Summer pinching in the youth of the tree is the only remedy for this defect, if it be not well furnished

below; and a severe remedy it is, for *all* the young shoots on the upper tiers, including the leader, must be pinched closely in May and June, till the lower ones have made young shoots of a sufficient length to give uniformity to the tree. This requires much



Fig. 1.

attention and trouble; it is better to be careful not to plant any tree for a pyramid that is not well furnished with buds and branches to its base. A tree of this description may soon be made to assume the shape of fig. 1, which is a perfect pyramidal pear tree, such as it ought to be in July, before its leading side shoots and perpendicular leader are shortened, which is best done towards the end of August; this shortening must be made at the marks —, and all the side shoots shortened in the same manner; also the leading shoot. Hooked pruning scissors will be found the best implement to prune with. The spurs *a a a* are the bases of the shoots that have been pinched in June.

PLANTING AND AFTER-MANAGEMENT.

As before mentioned, the autumnal and early winter months are to be preferred for planting. Care should be taken in selecting trees that are furnished with buds and branches from bottom to top; but if a young gardener intends to plant, and wishes to train up his trees so that they will become *quite* perfect in shape, he should select plants, one year old, from the bud or graft; these will, of course, have good buds down to the

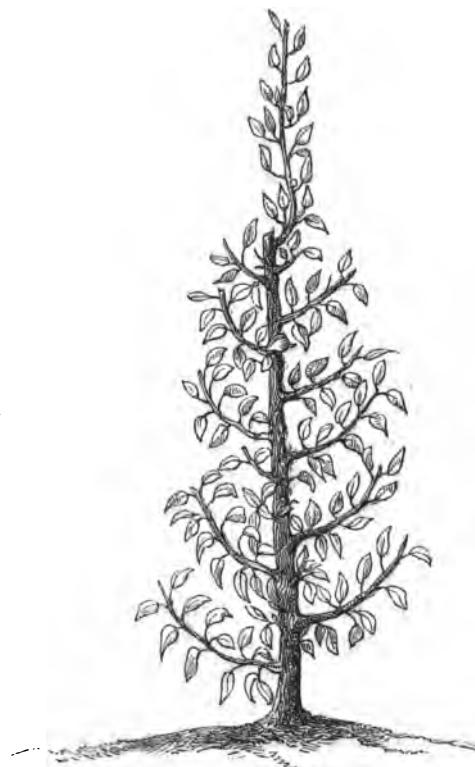


Fig. 2.

junction of the graft with the stock. The first spring, a tree of this description should be headed down so as to leave the shoot about 18 inches long; if the soil be rich, from five to six and seven shoots will be produced; one of these must be made the leader, a

not inclined to be quite perpendicular, it must be fastened to a stake. As soon, in summer, as the leading shoot is ten inches long its end must be pinched off; and if it pushes forth two or more shoots, pinch all off but one, to about two inches, leaving the topmost for a leader. The side shoots will, in most cases, assume a regular shape; if not, they may be this first season tied to slight stakes to make them grow in the proper direction. This is best done by bringing down and fastening the end of each shoot to a slight stake, so that an open pyramid may be formed; for if it is too close and cypress-like, enough air is not admitted to the fruit. They may remain unpruned till the end of August, when each shoot must be shortened to within eight buds of the stem;* this will leave the tree like the annexed figure, fig. 2, and no pruning in winter will be required.

The second season the trees will make vigorous growth: the side shoots which were topped last August will each put forth three, four, or more shoots; as soon as these are four inches long they must be pinched off to within three inches, *all but the leading shoot of each side branch*; this must be left on to exhaust the tree of its superabundant sap, till the end of August. The perpendicular leader must be topped once or twice; in short, as soon as it has grown ten inches, pinch off its top, and if it break into two or three shoots, pinch them all but the leader, as directed for the first season: in a few years most symmetrical trees may be formed.

When they have attained the height of six or eight feet, and are still in a vigorous state, it will be necessary to commence root-pruning, to bring them into a fruitful state.

I have thus far given directions for those who are inclined to rear their own pyramids. Much time and attention are required, but the interest attached to well-trained pyramids will amply repay the young cultivator.

I will now endeavour to give directions for the management of trees adapted for the gardener of mature age, who feels somewhat impatient if his trees do not begin at once to be fruitful. A most valuable auxiliary to precocious fruitfulness in pears is the quince stock: pears grafted on it may be safely recommended for all soils of moderate depth and fertility, and even for light and sandy soils I am induced to advise it, only in those circumstances the trees must have more care and higher cultivation.† In soils of that nature I should recommend the surface of the soil round the tree to be covered, during June, July, and August, with short grass, moss, or manure, and to give them once a week, in dry weather, a drenching with guano water (about one pound to ten gallons), which must be well stirred before it is used; each tree should have ten gallons poured gradually into the soil: by this method the finest fruit may be produced; and as it is very probable that, ere many years elapse, we shall have exhibitions of pears, this will be the mode to procure fine specimens to show for prizes. Our oldest gardening authors have said that "pears engrafted on the quince stock give the fairest fruit;" and they are correct. It has been asserted that the fruit is liable to be gritty, and deficient in flavour. I can only say that from my trees, growing on a cold clayey soil, I have tasted fruit of Marie Louise, Louise Bonne of Jersey, and others, all that could be wished for in size and flavour.

* There are generally three or four abortive buds at the base of each shoot; these must not be reckoned.

† In the light sandy soil, resting on loam, at Folkestone, I saw, in July, 1852, pear trees on quince stocks growing with remarkable vigour; and in France, near Boulogne, a few days after, I saw a plantation of three or four acres of pear trees on the quince growing in a light sandy soil also resting on loam. They were in the finest possible health. A subsoil of gravel, if within one foot of the surface, seems the most unfavourable of all sites for pears on the quince stock.

Pyramidal pear trees of from three to five years old on the quince stock, root-pruned, and full of blossom-buds, may now be purchased. Trees of this description should, if possible, be planted before Christmas; but if the soil be very tenacious, the holes may be opened in the autumn, and the trees planted in February; the soil will be mellowed and benefited by the frosts of winter.

In planting pear trees on the quince stock, it is, as I have very recently discovered, quite necessary that the stock should be covered up to its junction with the graft. This joining of the graft to the stock is generally very evident, even to the most ignorant in gardening matters; it usually assumes this form (Fig. 3, *a*) :—



Fig. 3.

If the soil be not excessively wet, the tree may be placed in a hole, three feet in diameter, in the usual way, so that the upper roots are on a level with the surface of the soil. Some of the light compost recommended in page 16 should be filled in, and the tree well shaken, so that it is thoroughly mingled with its roots; when this is done, and the compost trodden lightly, the tree, according to the usual method, is planted. With pear trees on the quince something more, however, is required: this is simply to form a mound of the above compost, which must cover the stock up to the junction of the graft to the letter *a* in fig. 3, in order to encourage it to emit roots into the surface soil, and to keep it—the stock—from becoming hard and “bark-bound.”

To make this emission of roots more certain, the stem may be tongued as usual in layering; *i.e.*, the bark must be cut through upwards from the root, and a slip about one inch in length raised (see fig. 3. *b b*, which are the raised pieces of bark), and these raised pieces of bark must be kept open by inserting a piece of broken flower-pot or slate. Several of these tongues may be made, and by the end of the first year after planting every incision will have emitted roots; the stock, owing to its being kept constantly moist, will swell and keep pace with the graft, and the tree will flourish and remain healthy. As the mound will subside by the heavy rains of water, presuming that the trees have been planted in autumn, fresh compost of the same nature must be added in spring, and again every succeeding autumn. The great object in the culture of the pear

on the quince stock is to encourage the growth of its very fibrous roots at the surface ; so that they may feel the full influence of the sun and air. These mounds may be made ornamental if required, by placing pieces of rock or flint on them, which will also prevent the birds scratching at them for worms ; but the stones selected must not be very large and heavy—they should be about the size and weight of a brick. In light friable soils the mounds may be from three to four inches above the surface of the surrounding soil ; in heavy retentive wet soils from six to eight inches will not be found too high.



Fig. 4.



Fig. 5.

In the course of my experience, and since the above recommendation to plant on mounds in light soils was written, I have found it good practice to plant pear trees on the quince stock in dry soils, level with the surface ; the first season to give them some manure on the surface, laid in a circle round the stem ; and the second year to dig out a shallow basin, two feet in diameter and four inches deep, round the stem, and fill it with some manure about half-rotten. This basin thus filled keeps moist even in the most dry and hot weather, and becomes full of fibrous roots. This is also an excellent method of renovating pear trees that have exhausted themselves by bearing too abundantly, or that appear unhealthy by their leaves turning yellow ; but in such cases, when the trees are of

advanced growth, a basin of the same depth, but three or more feet in diameter, should be formed, and filled with manure—in all cases for this purpose this should be but slightly decomposed.

Presuming that root-pruned pyramidal trees on the quince are planted as above-directed, pruning is the next thing to be considered; this, as the tree is already formed, is very simple, requiring slight annual attention in summer; the employment is light, and perhaps the most agreeable of all horticultural occupations. The first season after the planting, the side buds and branches will put forth young shoots, each will give from one to three or four; select that which is most horizontal in its growth (it should be on the lower part of the branch, as the tree will then be more inclined to spread) for a leader, and pinch off all the others to two inches in length (see fig. 1, *a,a,a*); if these pinched shoots again push, suffer them to grow two inches, and then pinch them to one inch; but if the horizontal branch has a good leader, it will take off all the superfluous sap, and prevent the pinched spurs from breaking; their buds will only swell, and the following season they will be fruit spurs. These should be thinned out in winter or spring, as directed in page 24.

Fig. 4 is a side branch in June, with its shoots not yet pinched; fig. 5 is a side branch with its shoots *a a*, pinched; *b* is the leader of the side branch, which should be pinched or cut off at the end of August to *c*.

The perpendicular leader of the preceding year's growth will in spring put forth numerous shoots, which must be pinched in June in the following manner: those nearest the base, leave six inches in length, gradually decreasing upwards, leaving those next the young leading shoot only two inches long. The leader of these ready-formed pyramids need not be shortened in summer, as directed for younger trees; it may be suffered to grow till the horizontal leaders are shortened in August, and then left six or eight inches in length; but if the trees are intended to be kept to six or seven feet in height under root-pruning, this leading shoot may be shortened to two inches, or even cut close down to its base; for tall pyramids of ten, twelve, or fifteen feet, it may be left from eight to ten inches in length till the required height is attained; it may then be cut to within two inches of its base every season.

I ought here to remark that pear trees differ in their habits to an extraordinary degree; some make shoots most robust and vigorous; others, under precisely the same treatment, are very delicate and slender. In the final shortening in August this must be attended to; those that are very vigorous must not have their shoots pruned so closely as those that are less so; indeed, almost every variety will require some little modification in pruning, of which experience is by far the best teacher. It will, I think, suffice, if I give the following directions for shortening the leaders of the side shoots, and the perpendicular leaders:—All those that are very robust, such as Beurre d'Amanlis, Vicar of Winkfield, Beurre Diel, &c., shorten to eight or ten inches, according to the vigour of the individual tree; those of medium vigour, such as Louise Bonne of Jersey, Marie Louise, and Beurre d'Aremberg, to six inches; those that are delicate and slender in their growth, like Winter Nelis, to four inches: but I must repeat that regard must be had to the vigour of the tree. If the soil be rich, the trees vigorous, and not root-pruned, leave the shoots the maximum length; if, on the contrary, they be root-pruned, and not inclined to vigorous growth, prune more closely.

The quenouille, or tying-down system, is now quite out of fashion in France, and in truth it does look very barbarous and unnatural. The trees trained in this manner in the Potagerie at Versailles are mostly on quince stocks; they are from twenty to forty years old, and are very productive, but very ugly; all the shoots from the horizontal and depressed branches are cropped off apparently in July, as M. Puteau, the director, is, I believe, adverse to the pinching system of M. Cappe. In my tour in the autumn of 1847, I did not observe a single quenouille in Belgium; all were pyramids, even in the gardens of the cottagers, and in general they were very beautiful and productive trees. In many cases, when on the pear stock, they were too luxuriant, and required root-pruning; but this I could not make the gardeners comprehend.

Pears on the quince may also be cultivated as horizontal espaliers by the sides of walks, or trained to walls with much advantage, as less space is required. Horizontal espaliers, or wall trees, on the pear stock, trained to walls of the usual height—*i.e.*, from ten to twelve feet—require to be planted twenty-four feet apart, while those on the quince may be planted only fifteen feet apart; this in a small garden will allow of much greater variety of sorts to supply the table at different seasons. With these the same high culture, if perfection be wished for, must be followed; the trees carefully planted, so that the junction of the graft with the stock is even with the surface of the mound formed as directed for pyramids. Careful annual root-pruning with the knife will leave scarcely anything to be done in that way with the branches of the trees; but if they put forth shoots inclined to vigour, these, after Mr. Thompson's method at the Horticultural Society's Gardens, may have their points cut off in June,* and towards the end of August be shortened to within two or three buds of their base. For fine specimens of wall pear trees grafted on the quince, I may refer to those on the west wall of the Horticultural Society's Gardens; these are now about thirty years old, and are pictures of health and fertility, thus at once settling the question respecting the early decay of pear trees grafted on the quince; for it has been often—very often—urged as an objection to the use of the quince stock, that pears grafted on it are, although prolific, but very short-lived. I have seen trees in France more than fifty years old, and those above referred to may be adduced to confute this error. My object is to improve the culture of fruit trees in small gardens; and to those conversant with such matters, I need only point to the very numerous instances of rich garden ground, entirely ruined by being shaded by large-spreading standard, or half-standard, unpruned fruit trees. Now, by cultivating pyramidal pears on the quince—apples in the same form on the paradise stock—the cherry as dwarf bushes on the *Cerasus Mahaleb*—and the plum as a pyramidal tree—scarcely any ground is shaded, and more abundant crops and finer fruit will be obtained.

* A correspondent in *Gardener's Chronicle*, No. 42, 1848, recommends stripping off the leaves from these shoots during summer to within three or four buds of their base; this seems to me an excellent idea.

ROOT-PRUNING OF PYRAMIDAL PEAR TREES ON QUINCE STOCKS.

Before entering on the subject of root-pruning of pear trees on quince stocks, I must premise that handsome and fertile pyramids, more particularly of some free-bearing varieties, may be reared without this annual, biennial, or triennial operation. I have a large plantation of pear trees on the quince stock, which bid fair to make very handsome and fertile pyramids, yet they have not been root-pruned, neither do I intend to root-prune them. But I wish to impress upon my readers, that my principal object is to make trees fit for small gardens, and to instruct those who are not blessed with a large garden how to keep their trees perfectly under control; and this can best be done by *annual*, or at least biennial, attention to their roots, for if a tree be suffered to grow three or more years, and then root-pruned, it will receive a check if the spring be dry, and the crop of fruit for one season will be jeopardised. Therefore, those who are disinclined to the annual operation, and yet wish to confine the growth of their trees within limited bounds by root-pruning—say once in three years—should only operate upon one-third of their trees one season; they will thus have two-thirds in an unchecked bearing state: and those who have ample room and space, may pinch their pyramids in summer, and suffer them to grow to a height of fifteen or twenty feet without pruning their roots. I have seen avenues of such trees in Belgium really quite imposing.

Pyramidal pear trees on the quince stock, *where the fruit garden is small*, and the real gardening artist feels pleasure in keeping them in a healthy and fruitful state by perfect control over the roots, should be operated upon as follows:—A trench should be dug round the tree, about eighteen inches from its stem, every autumn, just after the fruit is gathered, if the soil be sufficiently moist; if not, it will be better to wait till the usual autumnal rains have fallen;—the roots carefully examined, those inclined to perpendicular growth cut with the spade, which must be introduced quite under the tree to meet on all sides, so that no root can possibly escape amputation, and all the horizontal roots, except those that are *very small and fibrous*, shortened with a knife to within a circle of eighteen inches from the stem,* and all brought as near to the surface as possible, filling in the trench with compost for the roots to rest on; the trench may then be filled with the compost; well rotted dung and the mould from an old hotbed, equal parts, will answer exceedingly well; the surface should then be covered with some half-rotted dung, and the roots left till the following autumn brings its annual care. It may be found that after a few years of root-pruning, the circumferential mass of fibres will have become too much matted, and that some of the roots are bare of fibres towards the stem of the tree; in such cases, thin out some of the roots, shortening them at nine inches or one foot from the stem; this will cause them to give out fibres, so that the entire circle of three feet or more round the tree is full of fibrous roots near the surface, waiting with open mouths for the nourishment annually given to them by surface dressings and liquid manure.

Thus far for the gardener who does not mind extra trouble,—who, in short, feels real pleasure in every operation that tends to attain his end; but it is not every amateur

* If they have not spread to this extent the first season, or even the second, they need not be pruned, but merely brought near to the surface and spread out.

gardener that can do this, nor is it always required in the south of England, except for small gardens and in rich moist soils, in which pear trees are inclined to grow too vigorously, but with our too often cool moist summers in the northern counties, annual root-pruning is quite necessary to make the trees produce well-ripened wood; in other cases, as I have before observed, shortening the shoots in summer, taking care to produce a handsome pyramidal form, and if they are inclined to grow vigorously, occasional (say biennial or triennial) root-pruning with the spade will be quite sufficient.

The following will be found a good selection of varieties for pyramidal trees on quince stocks. These may be planted in rows, five to six feet apart, or a square may be allotted to them, giving each plant five to six feet, which will be found amply sufficient for root-pruned trees. Some few esteemed sorts of pears do not grow well on quince stocks, unless "double-worked," *i. e.* some free growing sorts are budded on the quince, and after having been suffered to grow for one or two seasons, those not so free growing are budded on them. For twelve varieties, placed in the order of their ripening, the undermentioned may with safety be recommended* (in the following lists, varieties marked thus \times may be chosen by those who require only a few trees).

1. Doyenné d'été \times	July	7. Alexandre Lambré.....	Nov. and Dec.
2. Bonne d'Ezée	August	8. Beurré d'Aremberg \times	December
3. Bon Chrétien (Williams') \times ..	September	9. Beurré Sterkman	<i>e.</i> December
4. Baronne de Mello \times	October	10. Zéphirin Gregoire \times	January
5. Fondante d'Automne.....	October	11. Josephine de Malines \times	March
6. Louise Bonne of Jersey \times	<i>m. & e.</i> October	12. Bergamotte d'Esperen \times	April and May

For twenty-four add—

13. Saint Denis	August	19. Beurré Clairgeau	<i>e.</i> November
14. Beurré Superfin	September	20. Winter Nellis \times	December
15. Colmar d'été	September	21. Beurré d'Anjou	<i>e.</i> December
16. Beurré Hardy.....	October	22. Bezy d'Esperen	January
17. Doyenné Gris	<i>e.</i> October	23. Prince Albert	March
18. Duchesse d'Angoulême.....	<i>b.</i> November	24. Doyenné d'Hiver Nouveau	April and May

The above succeed on the quince, and form well-shaped excellent pyramids.

ORNAMENTAL PYRAMIDAL PEAR TREES ON QUINCE STOCKS.

There are some few varieties of pears, the trees of which may be made highly ornamental even on a well-dressed lawn, as they grow freely and form naturally beautiful cypress-like trees, at the same time their fruit is of first-rate quality; such are Baronne de Mello, Duchesse d'Angoulême, Urbaniste, Alexandre Lambré, Beurré Hardy, Doyenné Robin, White Doyenné, Grey Doyenné, Louise Bonne of Jersey, Passe Colmar, Susette de Bavay, Bellissime d'Hiver, Zéphirin Gregoire, Beurré Leon le Clerc, Délices d'Hardenpont, and some others.

PROTECTORS FOR PYRAMIDAL AND BUSH PEAR TREES.

The weather in spring is often cold and ungenial for the blossoms of pear and other fruit trees; in such seasons pyramids should be protected; this is best done by fixing four stout stakes round a tree; these should be a little taller than the tree, and then be sawn off level; a square piece of calico, or any cheap canvas, should then be nailed on the top of the stakes to form the roof; the like material brought round the sides and

* All the varieties recommended for pyramids, may also be planted as espaliers to train to rails in the usual mode.

fastened to the stakes by small nails or tacks, from within eighteen inches of the ground to within eight inches of the top, thus leaving a space between the top and side covering for free ventilation, as the air when heated by the sun will rush out of the aperture at top in a continual stream; these flat-roofed square tents will generally ensure a crop of fruit. Pea sticks, *i. e.* stakes with the small brushwood on them, stuck round each tree, and spruce or other fir branches, where these can be procured, are also good protectors; for bush trees hay is a capital protector, particularly from those still hoar frosts which are generally so destructive; it should be strewed lightly over them. Netting, either old or new, will also be found a convenient protector for pyramids.

PEAR TREES AS BUSHES ON THE QUINCE STOCK.

It is only very recently that this mode of cultivating pear trees has struck me as being eligible, from having observed the fruit of some of the large heavy varieties, such as Beurré Diel and Beurré d'Amanlis, so liable to be blown off pyramids by even moderate autumnal gales. The trees also of these and several other fine sorts of pears are difficult to train in the pyramidal form; they are diffuse in their growth, and with summer pinching soon form nice prolific bushes, of which the following figure (fig. 6),



Fig. 6.

from nature, will give some idea; their summer culture, as regards pinching, is exactly that required by pyramids, and if the branches become crowded, they should be cut out cleanly with the knife, *i. e.* the branch should be cut out at the base, so as to leave no spur or inequality. These bushes are admirably adapted for gardens exposed to winds, and if removed biennially they may be grown in the smallest of gardens with great advantage. This biennial removal, or lifting, should be performed as follows:—A

trench should be opened round the tree the width of a spade, and from twelve to fifteen inches deep; the tree should then be raised with its ball of earth attached to its roots intact; if the soil be light and rich, and the tree inclined to grow vigorously, making annual shoots of more than one foot in length, it may be replanted without any fresh compost; but if, on the contrary, the soil be poor, and the tree stinted in its growth, the following materials may be used: in low situations, near brooks and rivers, a black moor earth is generally found; this unprepared, is unfit for horticultural purposes, but if dug out and laid in a ridge, and one eighth part of unslaked lime spread over it, turning it immediately and mixing the lime with it, it will become in the course of five or six weeks an excellent compost for pear trees. I have in some instances added half a bushel of burnt earth, or the same quantity of sand, to a barrowful of this moor earth, with good effect. Leaf mould (or rotten manure), loam (or light garden mould), and sand, equal parts, form an excellent compost; in planting, one wheelbarrowful to a tree will be enough. These bush trees offer one very great advantage—they are protected from spring frosts, when in blossom, with great facility, for a square piece of light cheap calico can be thrown over the tree, so as to cover it effectually without any framework, and yet not injure the blossoms; or, as I have said in the preceding page, dry hay can be strewed over them; but, perhaps, the best of all protectors is old netting, two or three times thick, thrown over the trees in February, and suffered to remain on till the fruit is safe from frosts, *i. e.* till the end of May. The following varieties are very eligible for bush culture, as they are spreading in their growth and difficult to form into compact pyramids, although they may be made into spreading and prolific conical trees; it ought, however, to be mentioned that those sorts, such as Louise Bonne of Jersey, which form handsome pyramids, make very pretty compact bushes by cutting out the central branch to within three feet of the ground, so that pyramids may be easily formed into bushes. I may add that these bush pears produce the very finest fruit, from their being so near the heat and moisture-giving surface of the earth.

LIST OF PEARS ADAPTED FOR BUSH CULTURE.

Alexandre Bivort.....	January.	Maréchal de Cour	November.
Beurré d'Amanlis.....	September.	Melon de Namur	September.
Beurré de Rance.....	March.	Onondaga	October.
Beurré Diel	December.	Rousselon	April.
Beurré Giffart	August.	Triomphe de Jodoigne	December.
Beurré Langelier.....	December.	Nouveau Poiteau	November.
Beurré Wetteren.....	February.	Jalousie de Fontenay Vendée.....	August.
Citron des Carmes	July.	Saint Lezin (for baking)	October.
Doyenné Boussoch	October.	Catillac (for baking)	December.
Jargonelle.....	August.	Leon le Clerc de Laval (for baking)	May.

UPRIGHT ESPALIERS AND PYRAMIDS FOR WALLS ON THE QUINCE STOCK.

In gardening, as well as in many other matters connected with active life, how much we owe to necessity! In April, 1849, I much wished to plant out one of each of some new and esteemed pears, on quince stocks, against a south-east fence, so that they would quickly come into bearing; the usual method of horizontal training I found would take up too much space, and I could not find room for half the number of trees I wished to

plant; in this strait an old idea came to my assistance—that of cutting pyramidal trees flat, and planting them against walls; and then a modification of the idea came to hand, viz., to plant horizontal espaliers, and to make them perpendicular. Here is the figure of one of my trees in full vigour.

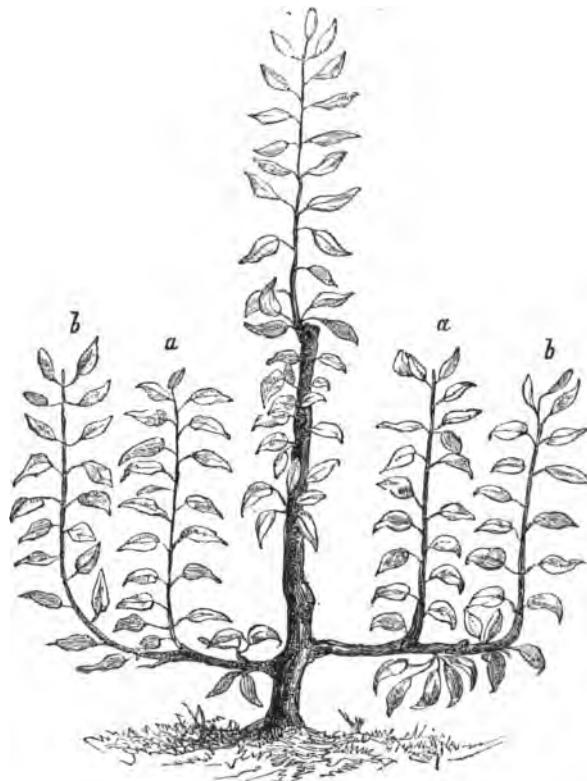


Fig. 7.

The shoots *a a* should be eight inches from the central shoot, and those marked *b b* the same distance from those marked *a a*; this tree, with five branches, will thus occupy thirty-two inches, say three feet of wall room; a tree with seven branches will require four feet, but, as some space ought to be allowed for the spurs on the outside branches, say five feet. If the wall be of a moderate height, eight feet for instance, a tree with seven branches will produce quite enough fruit of one sort. This method offers a strong contrast to espaliers on pear stocks, planted in the usual manner, twenty-four feet apart, and trained horizontally; nearly five trees for one will give so many additional chances to the pear cultivator: the single tree may fail, or its fruit may become imperfect, owing to an adverse season; but out of his five trees, he will, in every season, stand a good chance of having *some* good pears. A few words will suffice for their management; summer pinching and root-pruning—like Dr. Sangrado's bleeding and cold water—will do all.

If a trained dwarf pear tree on the quince stock can be procured, with five or seven branches, it may be planted against the wall or fence destined for it; and its young shoots *a a* and *b b* in fig. 7, which have probably been trained horizontally, be made to

curve gently till they are perpendicular,—the young shoots of pear trees are very pliable, and will easily bend to the required shape,—the lower part of each shoot must then be fastened to the wall with shreds and nails, in the usual way; each of these shoots must then be shortened, leaving them from ten inches to one foot in length; the leading shoot must be shortened to the same length. These shortened branches will, in May, each put forth two or three shoots; as soon as these are four inches long, pinch all but one on each branch to two inches, leaving the topmost one to each shoot *a a* and *b b* as above, also to the leader. You will thus, if your tree be five-branched, have five young leading shoots. As soon in June as they have attained to eight inches in length, pinch off the end of each, and when they break into two or three shoots as before, pinch so as to leave the spurs three inches long, all but one to each branch. This may be repeated, if the soil be rich, two, three, or four times in the summer; your tree will soon reach the top of

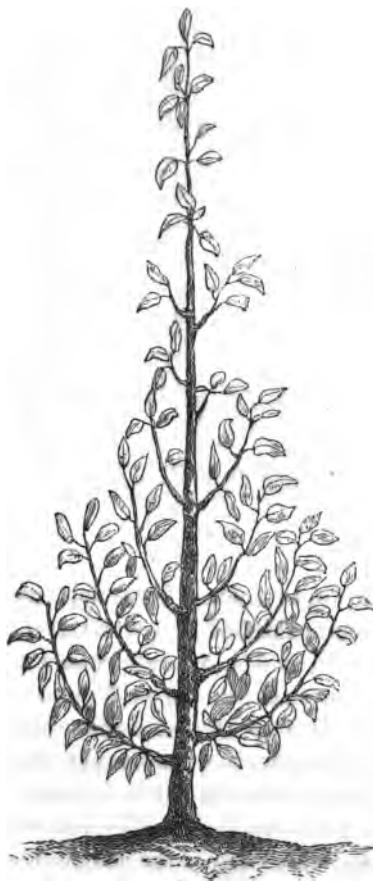


Fig. 8

the wall, and every bud in the five branches will be perfect—either a blossom-bud, or one in embryo. When every branch has reached the top of the wall, commence root-pruning in autumn; the directions for which are given in treating of pyramidal trees. These may be followed exactly; and if so, the trees will be kept in a stationary bearing state.

I may as well hint to the reader that, if larger trees are wished for, so as to give more fruit of each sort, trees with nine upright branches may be planted seven feet

apart, or trees with eleven upright branches, nine feet apart; trees, however, can seldom be purchased with shoots so numerous; young trees must, therefore, be planted and cut back annually for two or three years, till the proper number of perpendicular shoots are supplied. It may happen that trained trees with five or seven branches cannot be procured, perhaps trees with only three shoots, two horizontal and one leading shoot; in such cases they must be cut back, leaving five buds to each shoot, and the young shoots in June trained as required.

Pyramidal trees cut flat, and planted against walls or fences, will give almost a certain crop; their shoots must be pinched, and trained to the wall with nails and shreds in the pyramidal shape, so as to form a handsome tree, which, when it has reached the top of the wall, must be subjected to root-pruning, so as to keep it in a stationary fruitful state. Annexed I give a figure (fig. 8) of a young pyramid recently planted against a south-east fence.

It will, I trust, be seen how economical of space are these methods of training pears to walls; and I know of nothing in fruit culture more interesting than a wall of upright espaliers, or of pyramids full of fruit. Let us only consider that a wall one hundred feet long will accommodate *four* trees on the pear stock, trained in the usual horizontal mode; the same wall will give "ample room and verge enough" to *twenty* trees on the quince stock, trained perpendicularly, and root-pruned. They are also invaluable for planting against walls between old trees where there are bare spaces, as is so often the case; for they soon fill up such vacancies, and bear abundance of fine fruit. A selection of varieties for wall trees will not here be out of place.

UPRIGHT ESPALIERS ON QUINCE STOCKS.

FOR SOUTH OR SOUTH-WEST WALLS.

Crassane x
Doyenné d'Été* x
Chaumontelle

Passe Colmar
Glout Morceau x
Brown Beurré

Beurré Bretonneau
Gansel's Bergamot

FOR WEST OR NORTH-WEST WALLS.

Beurré Diel x
Beurré d'Amanlis
Beurré Langelier x
Beurré de Rance

Beurré Sterckman x
Van Mons, Leon le Clerc
Marie Louise x

Louise Bonne of Jersey
Josephine de Malines x
Beurré Clairgeau

FOR EAST OR SOUTH-EAST WALLS.

Beurré, Easter x
Citron des Carmes
Beurré d'Aremberg x

Bergamotte d'Esperen x
Winter Nelis x
Doyenné d'Hiver nouveau

Prince Albert
Triomphe de Jodoigne x
Beurré d'Anjou x

The above varieties grafted on pear stocks are equally adapted for their several aspects. In shallow gravelly or chalky soils, pears on pear stocks are much to be preferred for walls.

It is almost useless to plant dessert pears against north or north-east walls, as the fruit is always deficient in flavour. The only varieties that offer the least chance of success are Marie Louise, Dunmore, Louise Bonne of Jersey, and Flemish Beauty. It is far better to plant against such aspects, baking or stewing pears, such as Catillac,

* This will ripen on walls towards the end of June, quickly followed by Citron des Carmes.

Bellissime d'Hiver, Passe Tardive, and Léon le Clerc de Laval; the Vicar of Winkfield is also a good north wall pear—it bears well and stews well.

In the extreme north the finer sorts of pears can only be had from south walls. In recommending pears on quince stocks, as pyramidal trees for cold soils and situations, even in the far north, I may appear theoretical; but from my own experience in some very cold and clayey soils in this neighbourhood, I feel sanguine as to the result, for I have observed in my frequent visits to the pear gardens of France that many sorts are often *too ripe*. Now, this is just the tendency we require. In our cold and moist climate, most certainly, pears will not get *too ripe*, more especially in the north of England and Scotland. I have recently received communications from Durham and other places, stating that their pears have ripened admirably on pyramidal trees, and on walls on the quince stock; the extreme north will not be too cold to expect this result. I may, perhaps, be allowed to give an extract from a note received from a friend living near Ashbourne, in Derbyshire, as follows:—

"I have tried Beurré Diel, Beurré de Capiaumont, Marie Louise, and Williams' Bon Chrétien, on pear stocks, all of which bear well as standards, but their fruit does not come to perfection—always remaining quite hard till they decay at the core. I have placed the fruit in a hot-house, but have never succeeded in ripening them. Williams' Bon Chrétien we can only use for stewing." This seems to show that cold hilly situations are not favourable to the cultivation of pears as standards; I have recommended some pears on quince stocks, and have heard of a favourable result.

The Portugal quince has been strongly recommended by some authors as the only fit stock for the pear. I have never yet seen the true Portugal quince in the French nurseries used as a stock. This sort, as is well known, has very large downy leaves, and produces the largest fruit of all the quinces: it will not grow from cuttings, and the pear does not grow well when budded or grafted on it. There is, I am aware, in France a small-leaved variety, called the Portugal quince; this is the sort described and recommended as a stock by Comte Lelieur, in his book "La Pomone Française," and I am induced to think that from this has arisen the idea that the Portugal quince is the only proper stock.

Before quitting the subject of pears on the quince stock, it may be of interest to give a few words on

THE CULTURE OF PEAR TREES IN POTS.

In my visit to the nurseries of Belgium in 1847, I was preceded by a nurseryman from Riga, who, as I understood from my informant, came every year to buy pear trees grafted on the quince for cultivation in pots, the trees in that part of Russia being housed till the severe weather was over, and then suffered to ripen their fruit out of doors in pots. I have, therefore, in the "Orchard House" (4th edition), gone fully into this mode of culture, which will be found by those who practise it a most interesting and certain mode of ensuring a crop of the choicer kinds of pears.

THE CULTURE OF PEARS ON DWARF WALLS.

Having had occasion within these two years to erect a large number of four-inch brick walls on which to train young peach trees, I have been much struck with their

eligibility for pear trees on quince stocks. A very large number of trees may be cultivated in this manner on a small piece of ground.

My walls have nine-inch foundation of three courses of brickwork in the ground, and they are carried up to four feet above the surface (it is scarcely safe to build them of a greater height), with nine-inch piers twenty feet apart; the coping for them is made of boiling coal tar mixed with lime and sand to the consistence of mortar, which is placed on the top of the walls thus ~~up~~ so as to carry off the water. This is a most cheap and efficacious covering—it can scarcely be called a coping, as it does not project over the edge of the wall. The best description of bricks for these light walls are the patent perforated bricks, but common stock bricks will do; the very best lime should be used (I have found the grey Dorking lime excellent), but any kind of lime made from limestone will do; that made from chalk in this county is not strong enough. Their cost, as I learn from my bricklayer, is about six shillings the yard in length; thus, a wall of the above height, twenty yards long, should cost six pounds. In places where bricks are cheap they may be built for less; if they are dear, and at a distance, their carriage will add to the expense. My walls are six feet apart, and about N.E. and S.W.; so that one side of each wall has a S.E. aspect, the other a N.W.; on the former may be grown the late-keeping pears, on the latter the earlier sorts, that ripen from October till the end of November. We thus have one excellent aspect—the S.E.; and one tolerably good—the N.W.: so that no wall space is lost.

The pear trees for these dwarf walls should be grafted on quince stocks, and trained horizontally. They may be planted five feet apart at first, and when their branches meet they should be interlaced, as in fig. 9, and if necessary—*i.e.*, if the shoots

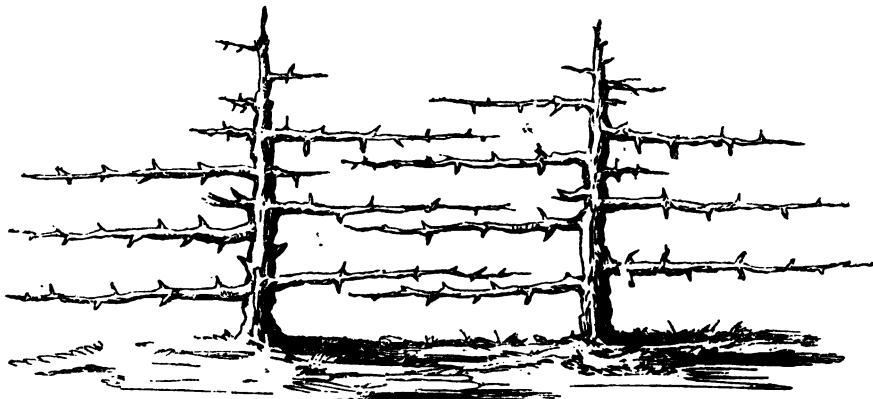


Fig. 9.

are long enough—they may be trained over the stems, so that the wall is completely furnished with bearing branches. At the end of five or six years every alternate tree may be removed, leaving the permanent trees ten feet apart. I advise planting thus thickly, because I know from experience that the temporary trees will fill the walls, will bear a good quantity of fruit, and look more satisfactory than if they are planted thinly. When removed they may be planted out for espaliers, or fresh walls built for them. I have some trees that have been planted six years; but I find that, owing to the soil not being rich, they have not grown rapidly, and need not yet be removed, as their branches only just cover all the fence to which they are trained. If, owing to the soil being rich, the

trees are inclined to grow vigorously and not bear, they should be lifted biennially; but pears on quince stocks will be sure to bear abundantly. These dwarf walls, when covered with well-trained trees, have a neat and charming effect; and the trees may be so easily protected, by sticking branches of evergreens in the ground and letting them rest against the wall, or by wooden shutters, placed on the ground at an angle so as to rest against the wall;—but I intend to be more luxurious, and to have cheap glass lights, in lieu of shutters, placed against the walls, and suffered to remain, so as to cover the trees till the fruit is fully formed, or till the first week in June, when all fear of damage from frost is over. Where two or more walls are built, or a square piece of ground devoted to them, a cross wall or walls should be built at the north-east end, to prevent the sharp current of wind from the north-east, which would blow up the intervals between the walls with great violence. It is surprising what a quantity of fruit may be grown on a small space of ground, with the aid of these walls. Peaches and nectarines may be grown on the S.E. aspect, but the trees must be kept in check by biennial removal. I have at this moment one thousand yards in length of them, and I intend to add to them annually, so convinced am I of their economy and utility.

GATHERING THE FRUIT.

The fruit of pears, more particularly those on quince stocks, should not be suffered to ripen on the tree; the summer and autumn varieties should be gathered before they are quite ripe, and left to ripen in the fruit room. The late pears should be gathered before the leaves take their autumnal tints; if suffered to remain too long on the trees they frequently never ripen, but continue hard till they rot. In most seasons, the first and second week in October is a good time; but much depends on soil and climate. The following passage from that very excellent work, Downing's "Fruit Trees of America," is appropriate to this subject.

"The pear is a peculiar fruit in one respect, which should always be kept in mind, viz., *that most varieties are much finer in flavour if picked from the tree, and ripened in the house, than if allowed to become fully matured on the tree.* There are a few exceptions to this rule, but they are very few. And, on the other hand, we know a great many varieties which are only second or third rate when ripened on the tree, but possess the highest and richest flavour if gathered at the proper time, and allowed to mature in the house. This proper season is easily known, first by the ripening of a few full-grown but worm-eaten specimens, which fall soonest from the tree; and, secondly, by the change of colour, and the readiness of the stalk to part from its branch on gently raising the fruit. The fruit should then be gathered—or so much of the crop as appears sufficiently matured—and spread out on shelves in the fruit room, or upon the floor of the garret. Here it will gradually assume its full colour and become deliciously melting and luscious. Many sorts which, ripened in the sun and open air, are rather dry, when ripened within doors are most abundantly melting and juicy. They will also last for a considerably longer period, if ripened in this way—maturing gradually as wanted for use—and being thus beyond the risk of loss or injury by violent storms or high winds."

"Winter dessert pears should be allowed to hang on the tree as long as possible, till the nights become frosty.* They should then be wrapped separately in paper, packed in

* I feel compelled to differ from Mr. D. in this respect; for last Autumn (1865), I suffered many pears to hang on the trees till the end of October, and they never ripened. I believe the first week in October to be the best period to gather winter pears in.

kegs, barrels, or small boxes, and placed in a cool, dry room, free from frost. Some varieties, as the Beurré d'Aremberg, will ripen finely with no other care than placing them in barrels in the cellar, like apples. But most kinds of the finer winter dessert pears should be brought into a warm apartment for a couple of weeks before their usual season of maturity. They should be kept covered to prevent shrivelling. Many sorts that are comparatively tough if ripened in a cold apartment, become very melting, buttery, and juicy when allowed to mature in a room kept at the temperature of 60 or 70 deg."

PYRAMIDS ON THE PEAR STOCK.

There are some dry, warm, shallow soils, more particularly those resting on chalk or gravel, which are unfavourable to the pear on the quince stock; it is difficult to make them flourish, unless great care is taken in mulching the surface, and giving them abundance of water and liquid manure in summer; in such soils pyramids on the pear stock may be cultivated with but little trouble.

To those who wish to train them as they should grow, one-year-old grafted plants may be selected, which may be managed as directed for young pyramids on the quince stock. If trees of mature growth are planted, they will require the treatment recommended for pyramids on the quince stock, as regards summer pinching. There is no occasion, however, to make a mound up to the junction of the graft with the stock, as the pear does not readily emit roots. Annual root-pruning is quite indispensable to pyramids on pear stocks in *small* gardens, and it will much facilitate this operation, if each tree be planted on a small mound, the roots are then so easily brought to the surface. Annual surface manuring, as recommended for pyramids on the quince, is also highly necessary.

It now only remains for me to give some hints and directions as to the most eligible mode of root-pruning of pear trees on pear stocks, which has been practised here with much success for many years. For immediate effect, the trees should be prepared by annual root-pruning for one, two, or three years in the nursery; but if not so prepared, trees of the usual size and quality may be planted and suffered to remain for two years undisturbed, unless the soil is rich and they make vigorous roots the first season after planting, in which case operations may then commence the first season; thus, supposing a tree to be planted in November or December, it may remain untouched two years from that period; and then as early in autumn as possible a circumferential trench, twelve inches from the stem of the tree and eighteen inches deep, should be dug, and every root cut with the knife and brought near to the surface, and the spade introduced under the tree, so as completely to intercept every perpendicular root. The treddle spade used in this part of Hertfordshire is a very eligible instrument for this purpose, as the edge is steeled and very sharp. The following year, the third from planting, a trench may be again opened at fifteen inches from the stem, so as not to injure the fibrous roots of the preceding summer's growth, and the knife and spade again used to cut all the spreading and perpendicular roots that are getting out of bounds; the fourth year the same operation may be repeated at eighteen inches from the stem; and in all subsequent root-pruning this distance from the stem must be kept; this will leave enough undisturbed earth round each tree to sustain as much fruit as ought to grow, for the object is to obtain a small prolific tree. I find that in the course of years

a perfect ball of fibrous roots is formed, which only requires the occasional operation of a trench being dug, and this ball of earth heaved down to ascertain whether any large feeders are making their escape from it. But it must be borne in mind that this circular mass of soil will in a few years be exhausted ; to remedy which, I have had left round each tree, eighteen inches from the stem, a slight depression of the soil, or, in other words, the trench has not been quite filled in. This circular furrow I have had filled, in December and January, with fresh liquid night-soil, which has had a most excellent effect ; any other liquid manure would undoubtedly be equally efficacious, but my soil was poor, and I thought it required strong manure. As it did not come in contact with the roots, no injury resulted from using such a powerful raw manure. There is perhaps no absolute necessity for liquid manuring in winter, as common dung may be laid round each tree in autumn, and suffered to be washed in by the rains in winter, and drawn in by the worms. In mentioning liquid manure, I give the result of my own practice ; the great end to attain seems (to use an agricultural phrase) to be able "to feed at home ;" that is, to give the mass of spongioles enough nutriment in a small space, but not too much, so that a tree may make shoots about four or six inches long in one season (for such I conceive ought to be the maximum of growth), and at the same time be able to produce abundance of blossom-buds and fruit. On trees of many varieties the former will be in too great abundance ; removing a portion in early spring, cutting them out with a sharp knife, so as to leave each fruit spur about three inches apart, is excellent culture.

I have not yet mentioned the possibility of root-pruning fruit trees of twenty or thirty years' growth with advantage. Irregular amputation of the roots of too vigorous fruit trees is, I am aware, an old practice ; but the regular, and annual or biennial pruning of them, so as to keep a tree full of youth and vigour in a stationary and prolific state, has not, that I am aware of, been recommended by any known author, although it may have been practised. In urging its applicability to trees of twenty or thirty years' growth, I must recommend caution ; the circular trench should not be nearer the stem than three feet, and only two-thirds of the roots should be pruned the first season, leaving one-third as support to the tree, so that it is not blown on one side by the wind, and these of course must be left where they will best give this support. The following season half the remaining roots may be cut, or, if the tree be inclined to vigour, all of them ; but if it gives symptoms of being checked too much, they may on the contrary remain undisturbed for one or even two seasons. If, as is often the case in pear trees, the roots are nearly all perpendicular, the tree must be supported with stakes for one or two years after complete amputation.

It will not perhaps be out of place here to enumerate a few of the advantages of systematic root-pruning of pear, apple, and plum trees, and of growing them as pyramidal trees and bushes.

1st. Their eligibility for small gardens, even the smallest.

2ndly. The facility of thinning the blossom buds, and in some varieties, such as Gansel's Bergamot, and other shy-bearing sorts, of setting the blossoms, and of thinning and gathering the fruit.

3rdly. It will make the gardener independent of the natural soil of his garden, as a few barrowfuls of rich mould and annual manure on the surface, will support a tree

for many, very many years, thus placing bad soils nearly on a level with those the most favourable.

4thly. The capability of removing trees of fifteen or twenty years' growth with as much facility as furniture. To tenants this will indeed be a boon; for perhaps one of the greatest annoyances a tenant is subject to is that of being obliged to leave behind him trees that he has nurtured with the utmost care.

My grey hairs tell me that I am not a young gardener, and yet I feel that in judicious root-pruning and annual manuring on the surface, so as to keep our fruit trees in a nicely balanced state, we are all young and inexperienced. At this moment I am reminded of a wall in a neighbouring garden,* covered with peach and nectarine trees in the finest possible health. For more than twenty years a healthy peach tree was never seen in this garden, as the sub-soil is a cold white clay, full of chalk stones. This happy change has been brought about by biennially pruning the roots of the trees early in autumn, as soon as the fruit is gathered, in some cases lifting them and supplying their roots with a dressing of leaf mould, sand, and rotten manure, equal parts; powdered charcoal, or the ashes of burnt turf and rotten manure, also make an excellent root dressing for cold heavy soils; but if the soil be dry and poor, and unfavourable to the peach and nectarine, loam and rotten manure is the best dressing for the roots, and also for the surface.

PYRAMIDAL APPLE TREES ON THE PARADISE APPLE STOCK.

Apples, as pyramids, on the Paradise stock, are objects of great beauty and utility; this stock, like the quince, is remarkable for its tendency to emit numerous fibrous roots near the surface, and for contracting the growth of the graft, causing it to become fruitful at a very early stage. On the Continent there are two or three varieties of the apple, under this denomination, viz., the Pomme de Paradis, the Pomme de St. Jean, and the Doucin: these are all called Paradise stocks in England, but on the Continent the first and last are used for distinct purposes; the first for dwarf bushes, the latter for pyramids. The Pomme de Paradis seems identical with the "dwarf apple of Armenia," referred to in the Journal of the Horticultural Society, Part 2, vol. iii., page 115, as used in the East. It is *exceedingly* dwarf in its habits, and too tender for this climate, unless in very warm and dry soils. Out of 2,000 imported in 1845, more than half died the first season, and two-thirds of the remainder the following one. They were planted in fine fertile loam, favourable to the growth of apples, and on which the Doucin, planted the same season, grew with the greatest vigour; the same result attended an importation of 2,000 in 1846. But very few are alive, and the apples grafted on them are exceedingly dwarf. I have now potted some plants, and owing, as I suppose, to the roots being warmed through the pots by exposure to the sun, they seem inclined to make very nice little fruitful bushes, in fact real miniature apple trees, bearing fruit when only nine inches in height. My trees are in six-inch pots; but to have healthy fertile trees, I should recommend them to be gradually shifted into twelve-inch pots. The citizen may thus have his apple orchard on the leads of his house.

* At Quendon Hall, Essex. The late gardener, Mr. Sillett, intended to have made the secret of his culture public by subscription (in 1848). He died suddenly, before he had prepared the materials for publication.

The Doucin and the English Paradise are most deserving of our attention as stocks for forming fruitful pyramids, the culture of which is very simple. Grafted trees of one, two, or three years' growth, should be planted with a straight leading stem, well furnished with buds and branches to its junction with the stock; no manure should be placed to their roots, but some light friable mould well shaken into them, the earth filled in, and two or three shovelsful of half-rotted manure laid on the surface round each tree; this surface dressing may be given with advantage every succeeding autumn. If the soil be very wet and retentive, or very shallow, it will be better to plant the trees in small mounds; and if symptoms of canker make their appearance, their roots should be examined annually in the autumn, as recommended in root-pruning of pears on the quince stock, introducing the spade directly under the roots, so as to prevent any entering deeply into the soil, and bringing all as nearly to the surface as possible, filling in the trench with light friable compost. I am not yet quite satisfied on that head, but am strongly inclined to think that canker may be entirely prevented by this annual attention to the roots, so that if the soil be unfavourable and apt to induce a too vigorous growth in apple trees, followed by canker, the roots should be annually root-pruned; or the trees lifted, *i. e.*, taken up and replanted, placing some rich compost—loam and rotten manure—to their roots; but if the trees make shoots of only moderate vigour, and are healthy and fruitful, their roots may remain undisturbed; and pinching their shoots in summer, and training them in a proper direction if required, is all that they will want. Pyramids on the Paradise stock may be planted four feet apart in confined gardens; five feet will give them abundance of room; but if, owing to the soil being of extra fertility, they are found to require more, the trees, if they have been root-pruned, may be removed almost without receiving a check, even if they are twenty years old. This is a great comfort to the amateur gardener, who amuses himself with improving his garden; for how often does a favourite fruit tree, which cannot be removed, prevent some projected improvement!

Apples differ greatly in their habits of growth: some are inclined to grow close and compact, like a cypress—these are the proper sorts for pyramids; others, horizontally and crooked—these should be grown as bushes; others, again, are slender and thin in their growth; the lower part of every branch will then generally be furnished with dormant buds; so that to form a good pyramid of these slender growing varieties, it is necessary to begin the first year with a graft, and to pinch the leader as soon as it is six inches long. If by any neglect the lower part of the pyramid be not furnished with shoots, but have dormant buds, or buds with only two or three leaves attached, a notch must be cut, about half an inch in width, just *above* the bud from which a shoot is required. This notch must be cut through the outer and inner bark, and cambium or first layer of wood; and if the shoot or stem be young, say from two to four inches in girth, it may be cut round half its circumference. If this be done in spring or summer, the following season a shoot will generally make its appearance; sometimes even the first season, if the stem or branch be notched early in spring. This method of procuring shoots from dormant buds may be applied with equal advantage to pyramidal pear trees. Varieties of apples, inclined to be compact and close in their growth, form very handsome pyramids; but they are apt to be unfruitful, as the air is not admitted enough to the interior of the tree. This may be easily avoided by bringing the lateral shoots down to a horizontal position for a year or two, and fastening the end of each shoot to a stake; an

open pyramidal shape will thus be attained, which the tree will keep. Other varieties put forth their laterals horizontally, and some are even pendulous. The leading perpendicular shoot of varieties of this description must be supported by a stake till the tree is of mature age. Iron rods, about the size of small curtain rods, are the most eligible; these, if painted with coal-tar, and lime sifted and mixed with it to the consistence of very thick paint, put on boiling hot, will last a great many years.

Apple trees in confined gardens near large towns, are often infested with "American blight," *aphis lanigera*; this makes its appearance on the trees generally towards the middle of summer, like patches of cotton wool. There are many remedies given for this pest; the most efficacious I have yet found is soft soap diluted with water to a thin paste, and applied with an old painter's brush. About two days after the application the trees must be well syringed with clean water. Many remedies, such as train oil, spirits of tar, &c., are apt to injure the trees; it must be recollected that soft soap will turn the leaves brown—in fact, kill them; but it need not be applied to them, as the *aphis* generally fixes itself on the branches.

Here let me impress upon the lover of his garden, living anywhere within reach of smoke, the necessity of using the syringe: its efficacy is not half appreciated by gardening amateurs. As soon as the leaves of his fruit trees are fully expanded, every morning and every evening, in dry weather, should the attentive gardener dash on the water with an unsparing hand—not with a plaything, but with the perforated common syringe, such as a practical gardener would use, capable of pouring a sharp stream on to the plant, and of dislodging all the dust or soot that may have accumulated in twelve hours. For apple and pear trees in pots or in small city gardens, this syringing is absolutely necessary. Pinching the shoots, and, indeed, exactly the same method of managing the trees as given for pyramidal pears on the quince stock, may be followed with a certainty of success; and the proprietor of a very small garden may thus raise apple trees which will be sure to give him much gratification. To have fine fruit, the clusters should be thinned in June; and small trees should not be overburdened, for they are often inclined, like young pear trees on the quince stock, to bear too much fruit when in a very young state; the constitution of the tree then receives a shock which it will take two or three seasons to recover. For varieties with large fruit, one on each fruit-bearing spur will be enough; if a small sort, from two to three will be sufficient. There are so many really good apples that it is difficult to make a selection; the following sorts will not disappoint the planter; but fifty varieties in addition, quite equal in quality, could be selected.

Twenty dessert apples, ripening from July to June, placed in the order of their ripening:—

1. Early Red Margaret 2. Red Astrachan × 3. Early Strawberry 4. Irish Peach × 5. Summer Golden Pippin 6. Kerry Pippin 7. Margil 8. Mannington's Pearmain × 9. Golden Reinette 10. Nonpareil, Pitmaston	11. Golden Drop (Coe's) × 12. Ashmead's Kernel × 13. Nonpareil, Old 14. Reinette Van Mons × 15. Syke House Russet 16. Keddalestone Pippin × 17. Golden Harvey 18. Northern Spy 19. Screveton Golden Pippin 20. Sturmer Pippin ×
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Twenty kitchen apples, fit for use from July to June:—

1. Keswick Codlin ×	11. Herefordshire Pearmain
2. Large Yellow Bough	12. Winter Colman
3. New Hawthornden ×	13. Bedfordshire Foundling
4. Cellini	14. Greaves' Pippin
5. King of the Pippins	15. Dumelow's Seedling ×
6. Blenheim Pippin ×	16. Norfolk Bearer
7. Calville Blanche	17. Rymer
8. Fearn's Pippin	18. Baxter's Pearmain
9. Wadhurst Pippin	19. Rostocker
10. Waltham Abbey Seedling	20. Gooseberry Apple ×

APPLES AS BUSHES ON THE PARADISE STOCK.

There are some varieties of apples that do not form, even with care, well-shaped pyramids; such sorts may be cultivated as bushes when grafted on the Paradise stock, and are then excellently well adapted for small gardens. The same biennial removal recommended for pears as bushes on the quince stock, and the same summer pinching of the shoots must be followed; the branches should also be thinned out, so that light and air are admitted to all parts of the tree. The following sorts are well adapted for this bush culture, but the upright varieties recommended for pyramids form nice compact bushes.

Brabant Bellefleur, kitchen	April
Cornish Aromatic, dessert	May
Early Harvest, dessert	August
Emperor Alexander, kitchen.....	October
Gravenstein, kitchen or dessert	November
Hawthornden, kitchen	{ August to November
Juneating (white), dessert.....	July
Melon Apple, dessert	February

Mère de Menage, kitchen	December
Nonesuch, kitchen	October
Pomme Royale, kitchen or dessert	April
Reinette de Canada, kitchen or dessert ..	May
Ribstone Pippin, dessert	December
South Carolina Pippin, kitchen	December
Spring Ribstone Pippin, dessert	May
Victoria, dessert	April
Waltham Abbey Seedling, kitchen	December

PYRAMIDAL PLUM TREES.

The Plum, if planted in a rich garden soil, rapidly forms a pyramid of large growth,—it, in fact, can scarcely be managed by summer pinching. It becomes crowded with young shoots and leaves, and the shortening of its strong horizontal branches at the end of summer is apt to bring on the gum: it is a tree, however, with most manageable roots, or they are always near the surface. I must, therefore, again recommend summer pinching, annual root-pruning, and surface-dressing, in preference to any other mode of culture. The annual root-pruning of the plum is performed as follows:—open a circular trench eighteen inches deep round the tree, eighteen inches from its stem, and cut off *every root and fibre* with a sharp knife; when the roots are so pruned, introduce a spade under one side of the tree, and heave it over so as not to leave a single tap root; fill in your mould, give a top dressing of manure, and it is finished. The diameter of your circular trench must be slowly increased as years roll on, for you must, each year, prune so within one-and-a-half or two inches of the stumps of the former year; your circular mass of fibrous roots will thus slowly increase, your tree will make short and well ripened shoots, and bear abundantly. From very recent experience, I have found that

removing the trees annually if the soil be rich,—biennially, and adding some rich compost, if it be poor—*without root-pruning*, will keep plum trees in a healthy and fertile state. For further particulars on this head, see page 32.

Pyramidal plum trees are most beautiful trees both when in flower and fruit. Their rich purple and gold crop has an admirable effect on a well-managed pyramid. No stock has yet been found to cramp the energies of the plum tree. I am, however, trying experiments on the sloe, which, as it never forms a tree of any bulk, is likely to effect this object. My trees on the sloe are some years old, and, I think, appear likely to be dwarf and prolific. The first year after grafting they made vigorous growth; but this is a very common occurrence with stocks that ultimately make very prolific trees; it is so with the pear on the quince, the apple on the Paradise, and the cherry on the Mahaleb. The greengage seems to grow more freely on the sloe than any other sort. I have three fine vigorous bushes, now about six years old, growing in the white marly clay, with chalk stones, peculiar to some parts of Essex and Hertfordshire. The sloe seems to delight in this soil, so inimical to most kinds of fruit trees. My greengage plums have made shoots three feet in length; and what appears strange is, that the stock seems to keep pace with the graft; there is scarcely any swelling at the junction. The roots of these trees have not been touched, and they appear to have gone deeply into the solid white clay. The plum on the sloe is easily arrested in its growth by root-pruning. I have some trees four years old, not more than eighteen inches high, and yet covered with bloom buds.* These have been only once root-pruned, and are forming themselves into nice compact prolific bushes. As no peculiar culture, or disease, requires to be noticed, I have only to give a selection of sorts calculated for pyramids. These are also well adapted for walls with W., N.W., E., or S.E. aspects.

HARDY DESSERT PLUMS ADAPTED FOR PYRAMIDS.

In season from July till the end of October. Placed in the order of their ripening:—

Early Favorite x
Mamelonné
Royal Hâtive.
Monsieur Gros Surpasse
Perdigon Violet Hâtif
Green Gage x
Purple Gage x
Huling's Superb x

Guthrie's Aunt Ann
Guthrie's Late Green
Jefferson x
Reine Claude de Bavay x
Coe's Golden Drop
Saint Martin's Quetsch
Coe's late Red

HARDY KITCHEN PLUMS ADAPTED FOR PYRAMIDS.

In season from July to the end of October. Placed in the order of their ripening:—

Early Prolific x
Goliath, or Caledonian
Prince of Wales x
Denniston's Superb
Nectarine
Pond's Seedling
Kirk's x
Victoria, or Alderton x

White Magnum Bonum
Bleeker's Scarlet
Orange
Diamond x
Autumn Compote x
Late Black Orleans x
Belle de Septembre x

I have thus far given the results of my experience in the culture of pyramidal

* Since this was written I have found plums grafted on the plum stock so easily dwarfed by biennial removal, that unless in hard clayey soils, found to be unfavourable to the plum, there is no occasion to employ the sloe stock.

trees. The method is not by any means new, for visitors to the Continent, for these last fifty years, must have often observed the numerous pyramids of France and Belgium. The system of annual root-pruning I must, however, claim as original, feeling assured that in our moist climate—too moist for many varieties of fruit—such an annual check is required to keep pyramids that are under summer pinching in a healthy fruitful state. The defect in the pyramidal trees of the Continental gardeners, is their tendency to an enormous production of leaves and shoots, brought on by severe annual pruning. The climate is probably too dry for root-pruning; yet I cannot help thinking that if it were followed by manuring thickly on the surface, and occasional watering, it would make their trees prodigiously fruitful.

At the risk of repetition, and writing from my own experience, I must say that no gardening operation can be more agreeable than paying daily attention to a plantation of pyramids. From the end of May to the end of July—those beautiful months of our short summer—there are always shoots to watch, to pinch, to direct, fruit to thin, and a host of pleasant operations so winning to one who loves his garden, and every tree and plant in it. To conclude, I may mention that the small Alberge apricot, raised from the stone, and producing small high-flavoured fruit, and also the Breda apricot, make very beautiful pyramids. In the southern counties of England, in a favourable season, they will ripen their fruit, and produce good crops. The large Portugal quince is also very prolific as a pyramidal tree. Some trees only two years old have borne fine fruit here. This is the finest of all the quinces, and in the south of Europe it grows to an enormous size. The medlar will also form a handsome and productive pyramid; and, “last but not least” in the estimation of the lover of soft fruits, the currant. A near neighbour, an ingenious gardener, attaches much value, and with reason, to the pyramidal currant trees; for his table is supplied abundantly with their fruit till late in autumn. The leading shoots of his trees are fastened to iron rods; they form nice pyramids of about five feet in height; and by the clever contrivance of slipping a bag made of coarse muslin over every tree as soon as the fruit is ripe, fastening it securely to the bottom, wasps, and birds, and flies, and all the ills that beset ripe currants, are excluded. With all these, summer pinching and root-pruning (except the currant, which does not require the latter operation), as directed for pears, are indispensable; they soon form very handsome pyramids, and make a pleasing variety in the fruit garden,

PLUM TREES AS BUSHES.

There is perhaps no fruit tree so easily kept within bounds as the plum. In some rich soils they bear annual removal without the least check; but in most soils biennial removal will keep them in a perfectly fruitful state in bush culture. This is absolutely necessary; and if the soil be poor, some thoroughly rotted manure, about half a bushel to each tree, may be mixed with the soil in replanting. As with pear trees, the best season for lifting or removing them is the end of October or beginning of November. Plum bushes have the advantage of being easily protected by a square of light cheap calico bunting, or any light material, thrown over them while in blossom, and a crop of fruit thus insured. All the varieties recommended for pyramids may be cultivated as bushes.

THE CULTURE OF CHERRIES AS DWARF BUSHES ON THE MAHALEB (CERASUS MAHALEB).

This stock has been long known in our shrubberies as the "Perfumed Cherry;" its wood when burned emits a most agreeable perfume. In France it is called "Bois de St. Lucie," and it has been there used for dwarf cherries for very many years;—why it has not been employed by English nurserymen, I cannot tell. My attention was called to it in France some ten or fifteen years ago, since which I have used it extensively, annually increasing my culture. Its great recommendation is, that cherries grafted on it will flourish in soils unfavourable to them on the common cherry stock, such as strong white clay, or soils with a chalky subsoil. Although the trees grow most vigorously the first two or three seasons, yet, after that period, and especially if root-pruned, they form dwarf prolific bushes, so as easily to be covered with a net, or, what is better, muslin or bunting, which protects the fruit more effectually from birds and wasps; thus giving us, what is certainly most rare, cherries fully ripe, and prolonging their season till the end of September. The trees may also be protected from spring frosts by the same covering, or by woollen netting, which is preferable, as it admits air to them while in blossom. These dwarf bushes may be planted from five to six feet apart, and their branches pruned so that seven, or nine, or more, come out from the centre of the plant, like a well-managed gooseberry bush. These branches will, in May or June, put forth, as in the horizontal shoots of pyramidal pears, several shoots at their extremities, all of which must be pinched off to within three buds of their base, leaving the leading shoots untouched till the middle or end of August, when they must be shortened, and the pruning for the year is finished.

The Morello and Duke cherries, the most eligible for this bush culture, may have their shoots shortened to eight buds; if, however, the space be confined in which they are planted, this length may be reduced, for by root-pruning the trees may be kept exceedingly dwarf. The end is to form the tree into a round bush, not too much crowded with shoots. Towards the end of September,* or, in fact, as soon as the autumnal rains have sufficiently penetrated the soil, a trench may be dug round the tree, exactly the same as recommended for root-pruning of pears, the spade introduced under the tree to cut all perpendicular roots, and all the spreading roots shortened with the knife, and brought near to the surface, previously filling in the trench with some light friable soil for them to rest on, and spreading them regularly round the tree, as near to the surface as possible; then covering them with the soil (if not too tenacious) that was taken out of the trench. No dung or manure of any kind is required, as this stock seems to flourish in the poorest soils. Some short litter or half-decayed leaves will, however, be of much benefit placed on the surface round the stem.

I have thus far given their culture for small gardens; but those who have more space may dispense with root-pruning, and allow their cherry trees to make large bushes, which may be planted eight feet apart, and pinched regularly in the summer, and managed as directed for root-pruned trees. The leading shoot from each branch in such cases must be left longer, and shortened to twelve or more buds.

I have a plant of the late Duke cherry, now ten years old; it has never been

* This early autumnal root-pruning will be found very advantageous. The flow of sap is checked, so that the shoots are well ripened and the pruned roots soon emit fresh fibres to feed the tree the following season.

root-pruned, and yet is a small prolific tree, five feet in height, and its branches the same in diameter. It will much facilitate the operation on their roots if the trees be planted on small mounds.

In forming plantations of dwarf cherries on the Mahaleb stock, it is necessary to arrange them with a little care. The two groups, those of the habit of the Morello tribe, and those of the compact habit of the May Duke, should be planted in separate rows. Bigarreau and Heart cherries are too short-lived when grafted on this stock in most descriptions of soils to be recommended.

The following arrangement will assist the planter:—

SECTION I.—THE MAY DUKE TRIBE.

Arch Duke x	Jeffrey's Duke x
May Duke x	Belle de Choisy
Royal Duke x	Nouvelle Royale

SECTION II.—THE MORELLO TRIBE.

Carnation	Reine Hortense
Carnation (Coe's late) x	Louis Philippe
Kentish	Belle de Sceaux
Late Duke x	Belle Magnifique x
Griotte de Chaux x	Abbesse d'Oignies
Morello x	

Cherries planted on the *Cerasus Mahaleb* are eminently adapted for espaliers, or for walls, as they occupy less space, and are much more fertile. They may be planted twelve feet apart, whereas espaliers on the cherry stock require to be planted eighteen or twenty feet apart. To those, also, who have no walls or fences, and who wish to grow Morello cherries, the Morello on the Mahaleb will be of great advantage, for the trees bear most abundantly, and form most ornamental little bushes. For potting, for forcing, cherries on this stock are highly eligible, as they do not emit gum, and are very prolific.

THE BIENNIAL REMOVAL OF FRUIT TREES WITHOUT ROOT-PRUNING.

For some few years past I have felt a growing conviction that peach trees trained against walls in the usual manner, without careful root cultivation, cannot, in our climate, be kept in a state at all healthy or fertile for a series of years. A wall covered with healthy peach and nectarine trees of a good ripe age is rarely to be seen; failing crops and blighted trees are the rule, healthy and fertile trees the exception. In page 25 will be found an allusion to the trees on the walls at Quendon Hall. I have reason to believe that all the success which the late Mr. Sillett had with his trees was owing in the first place to root-pruning, and afterwards to lifting his trees biennially, shortening an occasional straggling root, but not root-pruning them, and giving to each tree some rich light compost. The following mode of treating peaches, nectarines, apricots, and plums, on the removal system, I have found simple and efficacious.

Supposing a trained tree, of the usual size, to have been planted in a border well

prepared—*i.e.* stirred to a depth of twenty inches: it may be trained to the wall as usual, and suffered to grow two seasons; towards the end of October, or indeed any time in November in the second season, it should be carefully taken up with all its roots intact; if there be two or three stragglers—*i.e.* roots of two or three feet in length—for roots are remarkably eccentric, and often, without any apparent cause, run away in search of something they take a fancy to—cut off one foot or so, so as to make the roots of the tree more snug; then make the hole from whence you took your tree a little deeper, and fit to receive its roots without bending or twisting; place in it any light compost—if the soil be heavy, leaf mould, rotten manure, and loam, equal parts; but if the soil of the garden be light, two-thirds tender loam, not sandy, and one-third rotten manure. Two inches deep of this compost will be enough for the roots of the tree to rest on,—and mind they are carefully arranged so as to diverge regularly,—then add enough of the compost to cover all the roots, and fill in with the common soil. A tree that has been planted two years will require one barrowful; at the end of four years, two barrowfuls; when six years have passed, from three to four barrowfuls; and from four to six barrowfuls will be enough for a tree from twelve to twenty years old—in short, for a full-grown tree. A portion of the earth from the border must be removed when a large quantity of compost is added, to make room for it, so as not to have an unsightly mound. In the course of two or three removals the roots of the tree will become a mass of fibres, and the trees so docile as to be lifted without difficulty.

I have this day (Dec. 12, 1852) removed two plum trees that have been planted six years and removed twice. Their roots are a mass of fibres without one straggling root; they have been replanted with a barrowful of light compost to each tree,* and if I may judge by the enormous quantity of blossom-buds, they will bear a plentiful crop next season. They will receive no unhealthy check, for abundance of earth adheres to the mass of fibrous roots. Now, as peaches, nectarines, and apricots, being budded on plum stocks, are all on plum roots, they will give exactly the same results from the same mode of culture, neither the *size* nor *flavour* of the fruit will be affected, and the trees will always bear abundantly, and be healthy and flourishing. The plethoric habit of the Moor Park and Peach apricots, which so often leads to disease and death, will be effectually cured by this simple mode of culture, and peaches and nectarines will make short annual shoots, which will be always well ripened, so that they will be constantly full of healthy blossom buds. For trees under Mr. Ker's trellises it answers admirably. Some mulch or old tan, two inches in depth, placed on the surface of the soil as far as the roots spread, during the spring and summer, will be of much service.

All trees that are inclined to make very fibrous roots, such as plums, pears on quince stocks, and apples on Paradise stocks, may be lifted—*i.e.*, removed biennially, as above described—with equal or greater facility than root-pruning them. The effect is the same: they make short well-ripened shoots, and bear abundantly. Apples on Paradise stocks, cultivated as dwarf bushes or as pyramids, if lifted *every year*, and a shovelful or two of compost given to them, form delightful little trees.† The most delicate sorts of apples, such as Golden Pippins and Nonpareils, may thus be cultivated in the

* The soil is rich, and one barrowful I thought quite enough. The quantity of compost must be regulated by the wants of the soil for in rich soils where peaches and nectarines are apt to grow too freely, no compost need be added, but the tree merely lifted and replaced. A peach, nectarine, or apricot tree under the removal system, that makes annual shoots more than 15 inches in length, is too luxuriant, and will require no compost to its roots when replanted.

† In moist retentive soils the fruit spurs of small trees become covered with moss; some powdered lime sprinkled over them will destroy it; this is best done in foggy weather in winter.

most unfavourable soils; and roses, more particularly Bourbon roses on short stems, and Hybrid Perpetuals, removed annually in the autumn, giving to each tree a shovelful of rich compost, and not pruning their shoots till April, will bloom delightfully all the autumn, never dropping their leaves towards the end of summer, and becoming, as is too often the case, blighted and blossomless.

PROPER DISTANCES FOR PLANTING PYRAMIDAL AND OTHER FRUIT TREES.

Pyramidal pear trees and bushes on quince stocks, to be cultivated as root-pruned trees for small gardens, four feet apart.

The same in larger gardens, not root-pruned, six feet apart.

Pyramidal pear trees on the pear stock, root-pruned, six feet apart.

The same, roots not pruned, eight to ten feet—the latter if the soil be very rich.

Horizontal espalier pear trees on the quince stock for rails or walls, ten feet apart.

Upright espaliers on the quince stock for rails or walls, four to six feet apart.

Horizontal espaliers on the pear stock for rails or walls, twenty feet apart.

Pyramidal plum trees, six feet apart.

Espalier plum trees, twenty feet apart.

Pyramidal apple trees on the Paradise stock, root-pruned for small gardens, four feet apart.

The same, roots not pruned, six feet apart.

Espalier apple trees on the Paradise stock, fifteen feet apart.

The same on the crab stock, twenty feet apart.

Peaches and nectarines for walls, fifteen to twenty feet apart.

Apricots for walls, twenty feet apart.

Cherries, as bushes on the Mahaleb stock, root-pruned for small gardens, four feet apart.

The same roots, not pruned, six feet apart.

Espalier cherry trees, for rails or walls, fifteen to twenty feet apart.

Standard pear, apple, plum, and cherry trees, for orchards, twenty feet apart.

APPENDIX.

A NEW METHOD OF CULTIVATING PEACHES AND NECTARINES.

DEAR SIR,

As you desire, I send you an account of my protected fruit border for peach and nectarine trees.

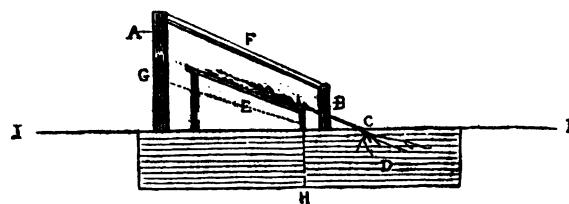
In the autumn I prepared a border from fifty to sixty feet long, drained, &c., as for a wall border for peaches. In this the trees were planted in a slanting position, and trained to a trellis twelve feet wide, about two feet six inches from the ground at the back, and one foot at the front. Strong larch posts were inserted in the ground at the corners of the trellis, and other posts, smaller, at every two feet were inserted, at the back and front; to these posts was nailed a plate two and a half inches by two, and to this plate were nailed rafters every five feet, to receive the lights, as in a hot-bed frame; and these lights (five feet wide and twelve feet long) were slightly fixed by screws to the plates; these are very roughly made, the wood not planed, and the bars of the lights were cut out at Mr. Montgomery's saw mills at Brentford, and the pieces cut out to form the rebates of the sash bars served for the bars of the trellis. The back posts are about four feet six inches in height from the ground, and the front about three feet;—perhaps five feet and three feet six inches would be better, as giving more room to train the trees, which are from one foot to fifteen inches from the glass. It would have been better if the ground under the trellis had been banked up, so as to let the earth be as near to the trellis as possible, that the trees might have received all the heat from the earth. The sides and back and front are entirely open; the current of air is complete; and there is room for the gardener to train, disbud, and syringe the trees without removing the lights. The advantage obtained is the entire protection of the blossom from frost and cold winds and rain, and an additional heat from the glass during the blooming season. About the beginning of June, when the fruit was well set and thinned, I removed the lights, stowing them away in a shed. I took them off thus early to prevent the chance of red spider. The wood being drawn, &c., after the fruit is off, I intend replacing the lights for the remainder of the autumn, in order to ensure the well ripening of the wood, thus obtaining, with no more trouble than with wall-training—indeed less—that which is imperfectly ensured by the latter—viz., the entire protection of the bloom, and the well ripening of the wood and fruit, even in a wet and cold autumn. This latter I propose to assist by laying on the border in front of the lights a strip of asphalte felt, to shoot off

the autumnal rains, thus preventing the continuance of the growth of the trees late in the season. During the very cold winds in the spring, a common net was hung in front of the trellis, to prevent, to a certain degree, the strong current of air passing between the glass and the blossoms. Not having planted my trees till very late, I was surprised to find I had a very fair crop of fruit this, the first, season; and you saw that its quality was far better than that on the wall trees. Having taken off the lights early, and the trees having been planted too late, the fruit did not ripen before that on the wall; but next season I shall leave on the lights till the middle of June, and shall, during the heavy cold rains of spring, protect the border by the asphalte covering; and as the trees will blossom somewhat earlier than those on the wall, I consider that the fruit will ripen from ten days to a fortnight before that on the wall trees: and this is important, as it is just the time of the year when fruit is scarce, the forced peaches and the general crop of strawberries being over. You will observe, then, there is no more trouble in this plan than in wall-training; indeed, training on a trellis is less troublesome than nailing, and the insects which harbour in the wall are avoided on the trellis. Strawberries in pots, for forcing, may be stowed away during the winter, and late endive planted, and thus be protected from wet and the severe frost. The lights and woodwork are covered with ship varnish, instead of paint, which is much cheaper than paint, and equally durable; the glass (threepence a foot) two feet long and one foot wide: and the cost of the whole not half that of a wall twelve feet high. The lights and woodwork may be removed by an outgoing tenant, or the site of the border changed at will. I mean, this autumn, to adopt your suggestion, and grow some peaches, nectarines, and figs as bushes; and these I propose to cover with a span glass roof, leaving the sides open, as in the structure I have described. As the whole cost consists in the glass and the rough framework, I consider that this plan may be well adapted for growing delicate kinds of pears now grown on south walls, and also some of the more delicate kinds of peaches which hitherto it has been difficult to fruit in this country; and I consider that as regards the better kind of late peaches, which rarely ripen, they will have the additional protection afforded by my plan, which will ensure the ripening of the crop even in bad seasons. I should be glad if you would suggest to me such kinds of fruits which it has hitherto been found difficult to fruit by reason of our climate, that I may try them under the glass this next year.

H. BELLENDE KER.

Swiss Cottage, Cheshunt, Herts,

Sept. 30, 1848.



- A. Back support to plate.
- B. Front ditto.
- C. The tree planted in the border.
- D. The border; six feet drained.
- E. The trellis, with the tree trained on it.

- F. The glass lights.
- G. Dotted line shows the earth banked up under the trellis.
- I. I. The line of the ground.

I have only to add to the above, that I saw Mr. Ker's peach trees towards the end of August, 1848, and found them, although only planted the preceding March, bearing a good crop of fine high-coloured fruit. The structure, of which is annexed a section, is of the most simple description, being merely a row of larch posts, back and front, on which are nailed plates and cross bars for the lights to rest on, having exactly the appearance of a large garden frame without back, sides, or front; under the lights the trellis is formed with a sharp slope upwards to the back; for unless the front of the trellis is within nine inches or one foot of the ground, it will be difficult to bend the trees to the required position. By this simple contrivance, peaches and nectarines may be grown in any corner of the garden, with a south or south-western exposure, for it is scarcely necessary to add that the lights should slope to the south or south-west, so as to have all the sun-heat possible.

The most eligible dimensions for a trellis, I find from experience to be as follows:—

Lights, eight feet long, three feet wide.

Trellis, seven feet from front to back.

Height from ground of trellis at back, two feet six inches.

Ditto, ditto, at front, six inches.

Distance of trellis from glass, one foot.

The front border should be raised to a level with the front of trellis; this will leave ten or twelve inches between the front ends of the lights and the surface of the front border, which will be quite enough for ventilation; indeed, the draught in windy weather is inclined to be too sharp. I find, therefore, furze, or other evergreen branches, placed along the front, between the glass and the border, an excellent check to excessive ventilation. They may remain there till June. The lights are fastened to the plate back and front by a hook-and-eye; they are thus easily removed to prune the trees, gather the fruits, &c. The ends of the trellis should be boarded up. I was induced, as I thought, to improve upon Mr. Ker's plan by having my first trellis within eight inches of the glass, for I calculated, the nearer the glass the better the chance of success in early ripening; but I have suffered for my innovation. My peach trees were planted in March, 1848; they made during the summer, with the lights constantly on, beautifully matured shoots, and in March and April, 1850, were gay with blossom: the winds were cold, the nights frosty; but owing to the extreme ventilation, which kept every bud and shoot dry under the glass, not a blossom was injured by the sharp winds, and the trees were covered with fruit. On the fatal third of May, 1850, a still hoar frost—the thermometer down to 23° —destroyed all my hopes, for, owing to the trees being too near the glass, every fruit was blackened and destroyed—a single mat would have saved them; but I was not at home, and my pet trees were forgotten. Do not, therefore, have the trellis nearer the glass than from twelve to fifteen inches.

It will be seen that I employ smaller lights, which are easily removable for purposes of culture, and a smaller trellis than that described by Mr. Ker. I find from experience this smaller edition of the Kerrian trellis much to be recommended for small gardens; but Mr. White's fixed roof and sunken path, as described in the following page, is the best of all for those who wish to grow large quantities of fruit.

Extract from the *Gardener's Chronicle*, No. 39, 1852.

"The kitchen garden and glass structures at Mr. Ker's are situated on the east side of the house. Among the latter perhaps the most interesting is a protected trellis, *i.e.* a rough trellis covered with glass sashes 10 feet in length, resting on 4-feet posts at the back and 1½-foot supports in front. The back is quite open; but the ends are closed with deal boards, and an 11-inch plank is nailed along the front, but so as to admit plenty of air. From this trellis, which is about 16 yards long and contains four trees, Mr. Ker has, this year, had a crop of between 40 and 50 dozen first-rate well-ripened peaches, which for colour, size, flavour, and juiciness, could not be surpassed by the best fruit from a wall. His success this untoward season is perfect, and, therefore, the advantages arising from such contrivances will be obvious, and they are so simple in their construction that a clever labourer might erect one in a day. No mildew has attacked the trees on this trellis; and although red spider began to make its appearance during the hot weather of July, it was soon checked. We understood Mr. Wooley, the gardener, to say that he took off the lights, and kept them off for four or five weeks. This treatment arrested the progress of the spider, and prevented the trees from receiving any injury from it. This temporary exposure of the trees has slightly retarded the ripening of the fruit, so as to make them succeed those on the walls. Mr. Wooley mentioned that he had in former seasons retarded mid-season peaches (such as Grosse Mignonne, Royal George, and others) till the beginning of October, by keeping off the lights till the beginning of September. We had almost forgotten to add, that Mr. Wooley protected his trees from the severe spring frosts by covering the glass with refuse hay when the nights were frosty, which seems to have been a most efficient protection. This year's wood is ripening satisfactorily, and there can be no doubt there will be a good crop again next season."

THE PEACH TRELLIS OF THOMAS WHITE, ESQ., MANOR HOUSE,
WEATHERSFIELD, ESSEX.

In the autumn of the year 1851, Mr. White, while walking through the grounds, happened to see my small Kerrian trellis with movable lights, and on his return home the idea occurred to him that it might be enlarged, and the principle improved upon, so as to be able to grow fruit enough for a large family. In the autumn of that year he accordingly built a trellis-house of the following dimensions:—

Length	80 feet.
Width (inside)	12 feet.
Height at back	8 feet.
Height at front	14 inches.
Rafters (fixed twenty inches apart)	14 feet long.
Trellis (fifteen inches from the glass)	13 feet wide.
Sunken path in centre	2 feet deep.

The front and back plates both rest on larch poles about four or five feet apart; a shutter, twelve inches wide, on hinges, forms, with a slip of board, the front wall. The back wall is made with long fagots of brushwood—a double row; the ends are boarded up, and a door is at each end. Perhaps no gardening structure was ever built so cheaply, and none

ever produced such marvellous effects. The trees—dwarf and standard trained peaches and nectarines, two to three years trained, twelve of the former and six of the latter—were planted in February, 1852; and this season (1854), only the third year of their growth, they have given 5,000 *peaches and nectarines*. On one tree of the Noblesse Peach there were 500 peaches, and the same number or more on a tree of the Ebruge Nectarine. This seems enough to ruin the health of the trees, and so I thought when I *heard* of it; but when I *saw* the excessive vigour of the trees, I thought Mr. White and his gardener not so far wrong in allowing them to bear such an enormous crop. The dwarf trees have reached to the top of the trellis, and cover it so completely that the standards must be removed this autumn.

Mr. White was, I believe, offered the sum that the house cost him—somewhere about £40—for his crop of peaches and nectarines. The vigour of the trees is quite astonishing; the stems of some of them are twelve or more inches in circumference; they are planted inside the front shutter, and laid directly on the trellis. The remarkable success of this simple structure seems owing entirely to the perfection of its ventilation; the front shutter has been open night and day in warm weather, and the air passes gently and constantly through its brushwood back wall, so as entirely to prevent stagnation. The trees have been syringed regularly night and morning, and are in the finest possible health. As this brushwood wall is unsightly, and dangerous in some situations owing to its capability of harbouring rats and mice, we must now see what can be substituted for its perfect ventilating property. Hedges to *lean-to* houses, as I know from experience, are too cold to ripen peaches and nectarines, although highly favourable to the growth of the trees; it therefore appears to me that the perforated bricks, now largely manufactured, could be used with advantage in this way. The wall, eight feet in height, should be built five feet from the ground with common bricks; and then, three feet up to the top for the plate to rest on, with perforated bricks placed edgewise; in very cold weather in March, when the trees are in blossom, a curtain of calico, or any other convenient material, might be arranged so as to cover this space of the perforated wall at night, and in May it may be removed for the summer. This perforated space, with the front shutter constantly open, will, in my opinion, be perfect for a peach trellis, and not unsightly.

It will be seen from what I have said that Mr. White's trellis differs from Mr. Ker's in this way,—the roof is fixed, and not of removable lights; the trees are pruned and the fruit is gathered from underneath, so that all the operations of culture are performed under shelter, and in a climate at all times favourable.

REFERENCES TO FIGURES AT END.

Fig. 1.—A small tree of Beurré d'Amanlis, grafted on the Quince stock. This is given merely to show the tendency to productiveness given by using the Quince stock.

Fig. 2.—Portrait of a Pyramidal Pear Tree, 10 years old, 6 feet high, of Beurré de Capiaumont, grafted on the Quince. This has been root-pruned three times within these last six years.

Fig. 3.—An upright or pyramidal Apple Tree, grafted on the Paradise stock; root-pruned last December.



